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Matsui

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(54) **BLOWER FOR AIR-CONDITIONED GARMENT AND AIR-CONDITIONED GARMENT**

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A41D 13/002 (2006.01)
(Continued)

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CPC ***A41D 13/0025*** (2013.01); ***F04D 25/0673*** (2013.01); ***F04D 25/084*** (2013.01); ***F04D 29/601*** (2013.01)

(58) **Field of Classification Search**
CPC A41D 13/0025; F04D 25/0673; F04D 25/084; F04D 25/12
See application file for complete search history.

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Primary Examiner — David E Sosnowski
Assistant Examiner — Jason G Davis
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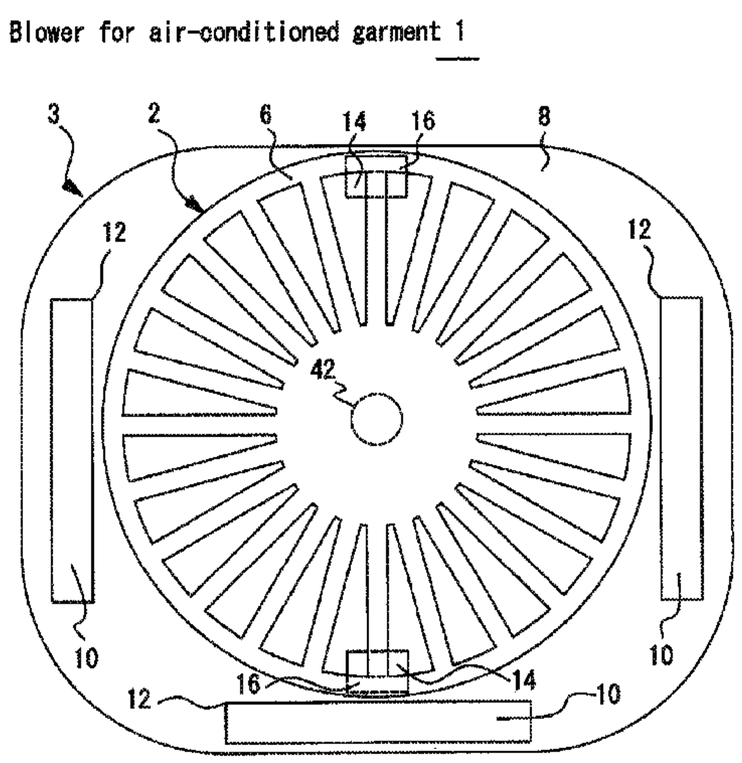
(57) **ABSTRACT**

A blower for an air-conditioned garment is provided with a blower unit having a fan driven by a motor, and a power supply unit for supplying power to the blower unit. The blower unit is provided with a first housing that houses the fan. The power supply unit is provided with a second housing that houses a battery. The first housing is provided with a first contact part through which the power supplied by the power supply unit can be supplied. The second housing is provided with a second contact part which is arranged in a position corresponding to the first contact part and abuts the first contact part. The first housing and the second housing each have a shape detachably engageable with each other.

8 Claims, 23 Drawing Sheets



(51) **Int. Cl.**
F04D 25/06 (2006.01)
F04D 29/60 (2006.01)

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* cited by examiner

Fig. 1

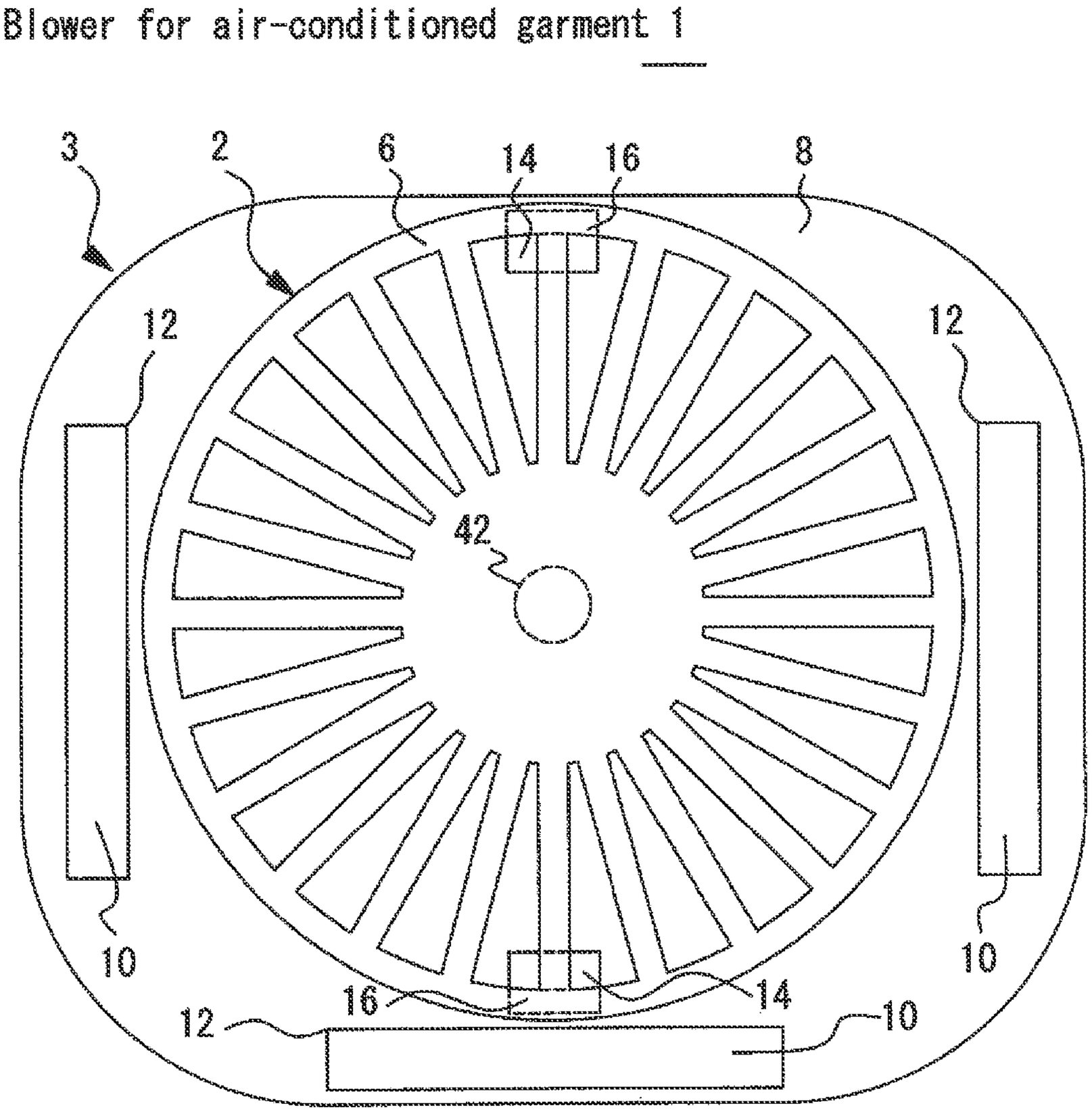

Blower for air-conditioned garment 1
3
2
6
14
16
8
12
12
42
10
10
16
14
12
10

Fig. 2

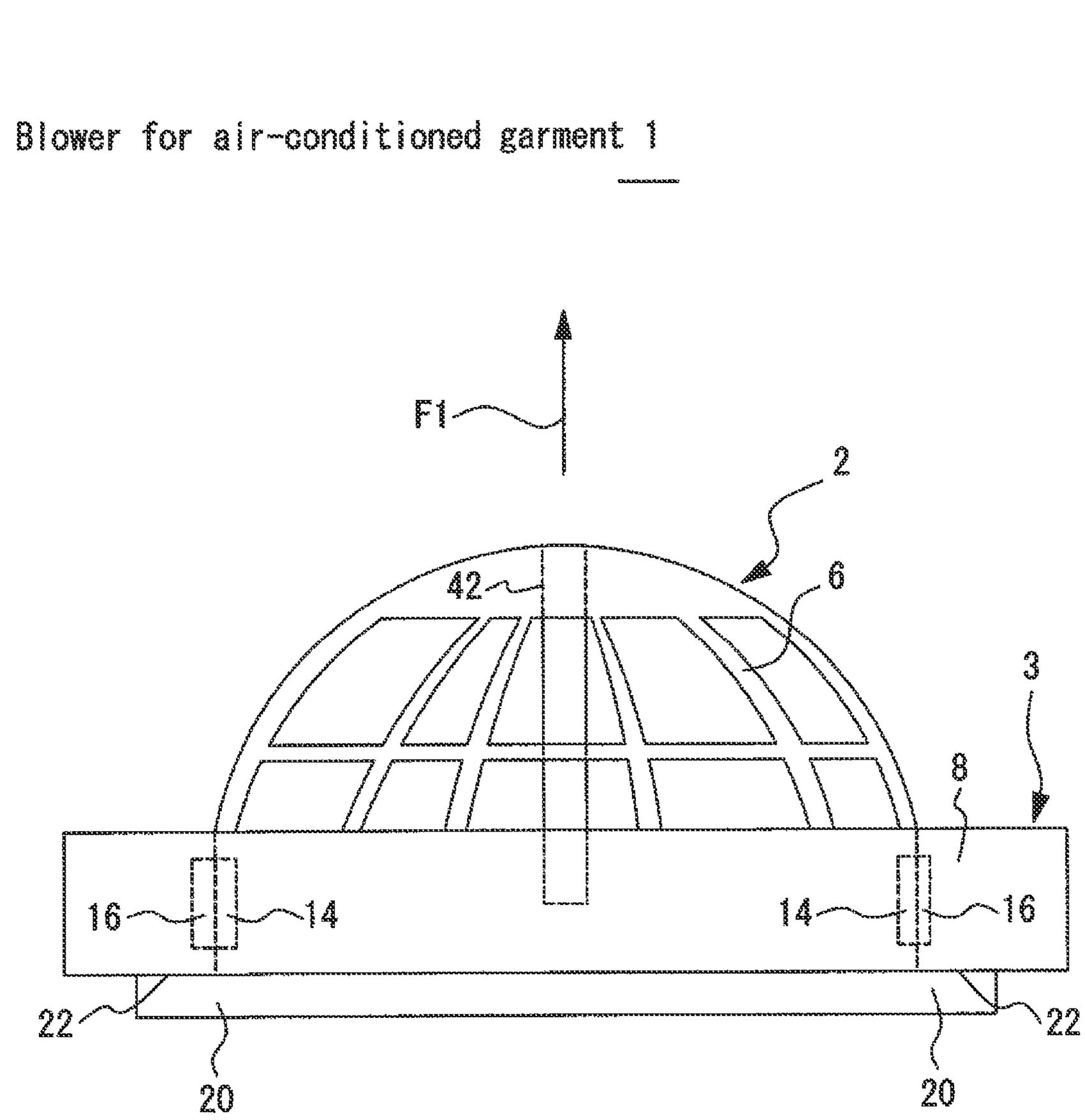

Blower for air-conditioned garment 1
F1
2
42
6
3
8
16
14
14
16
22
22
20
20

Fig. 3

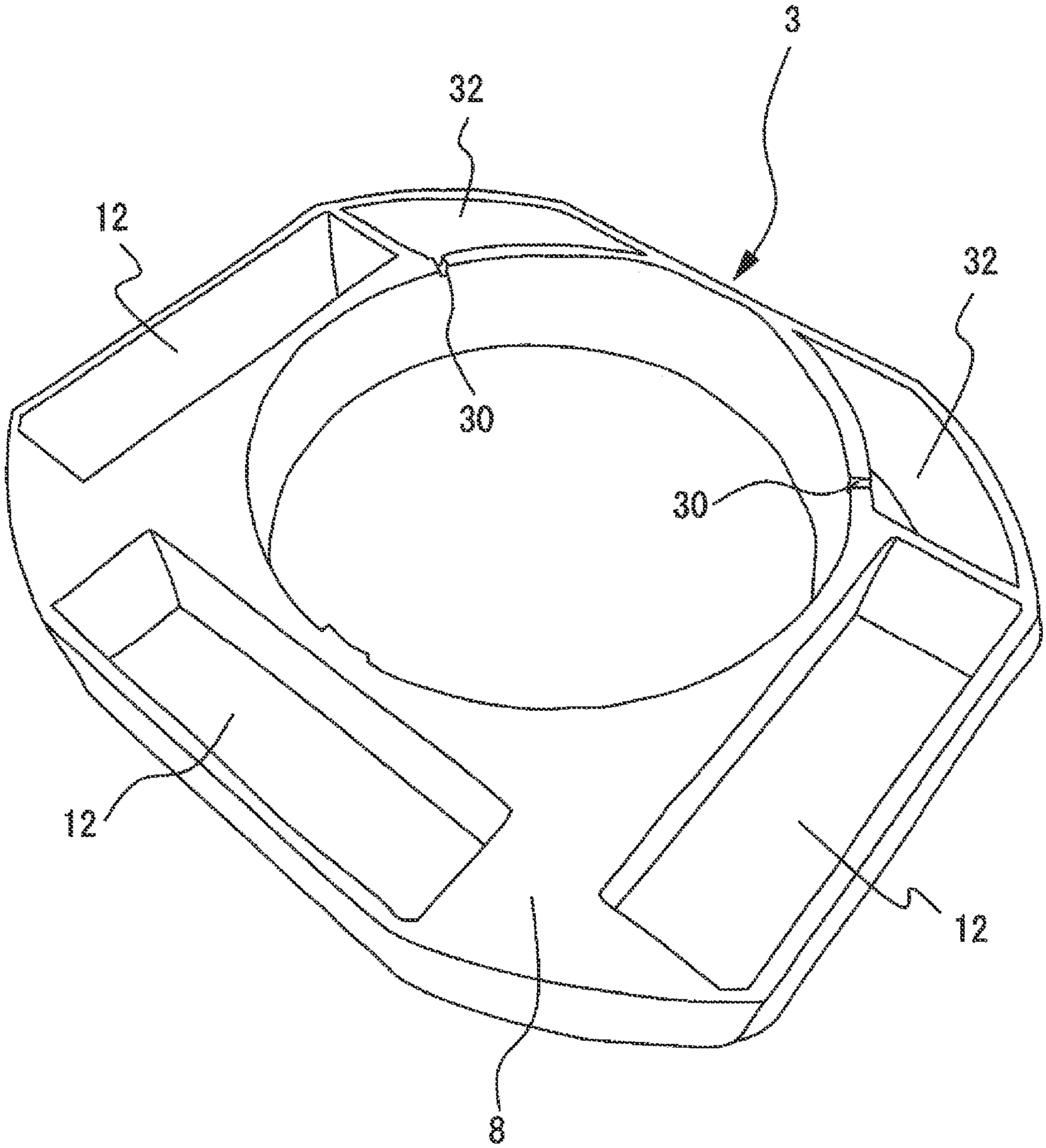


Fig. 4

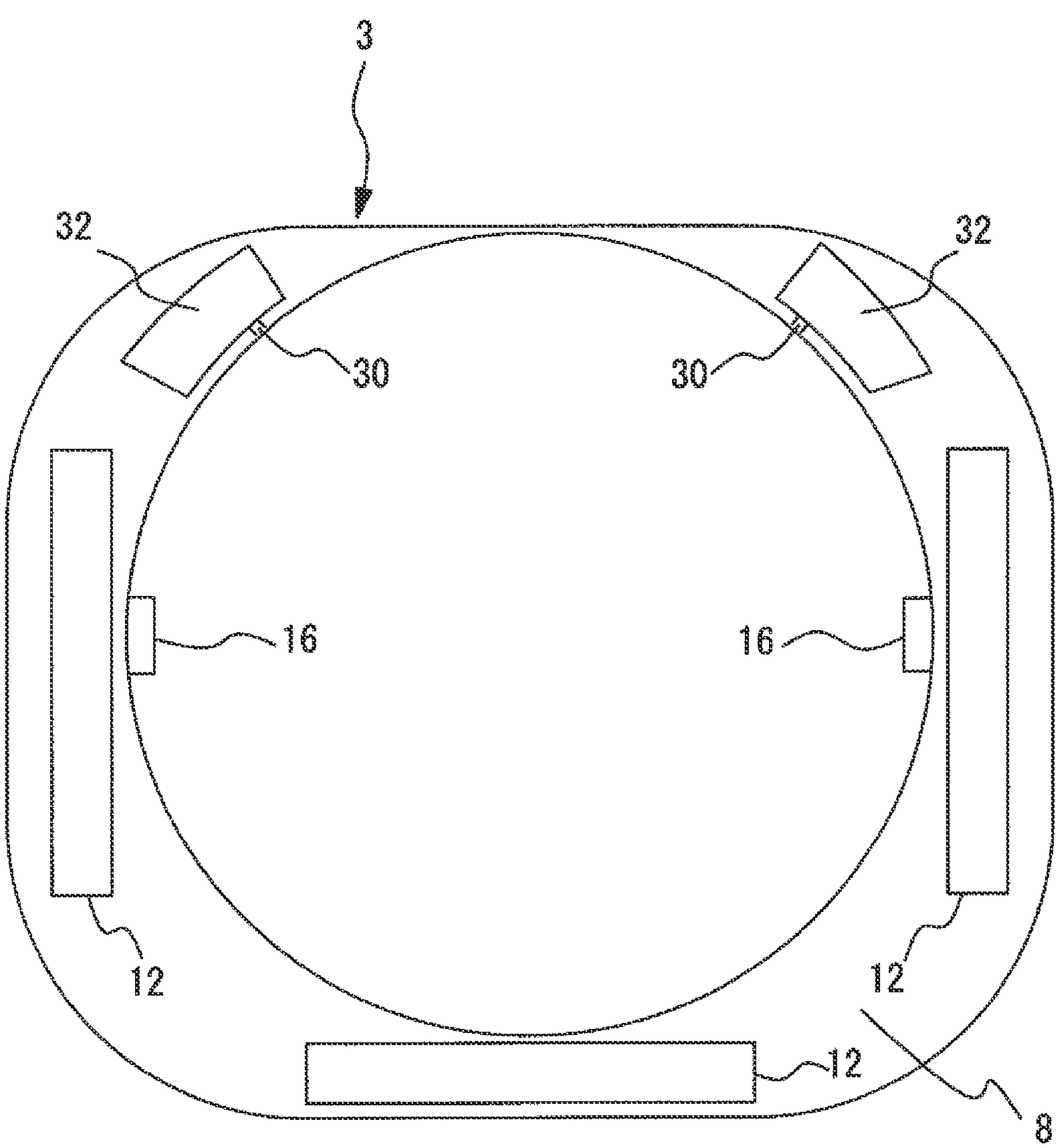


Fig. 5

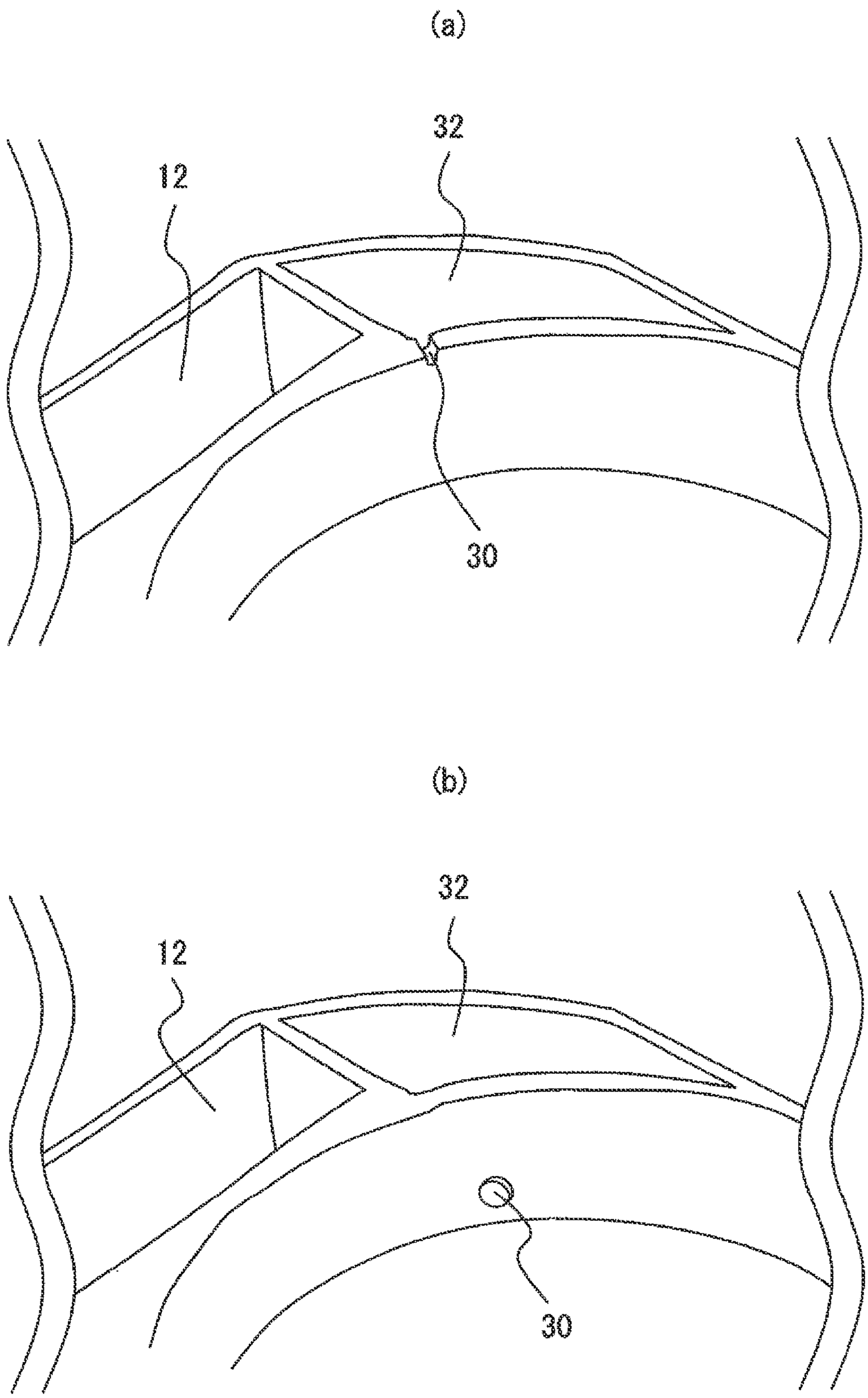


Fig. 6

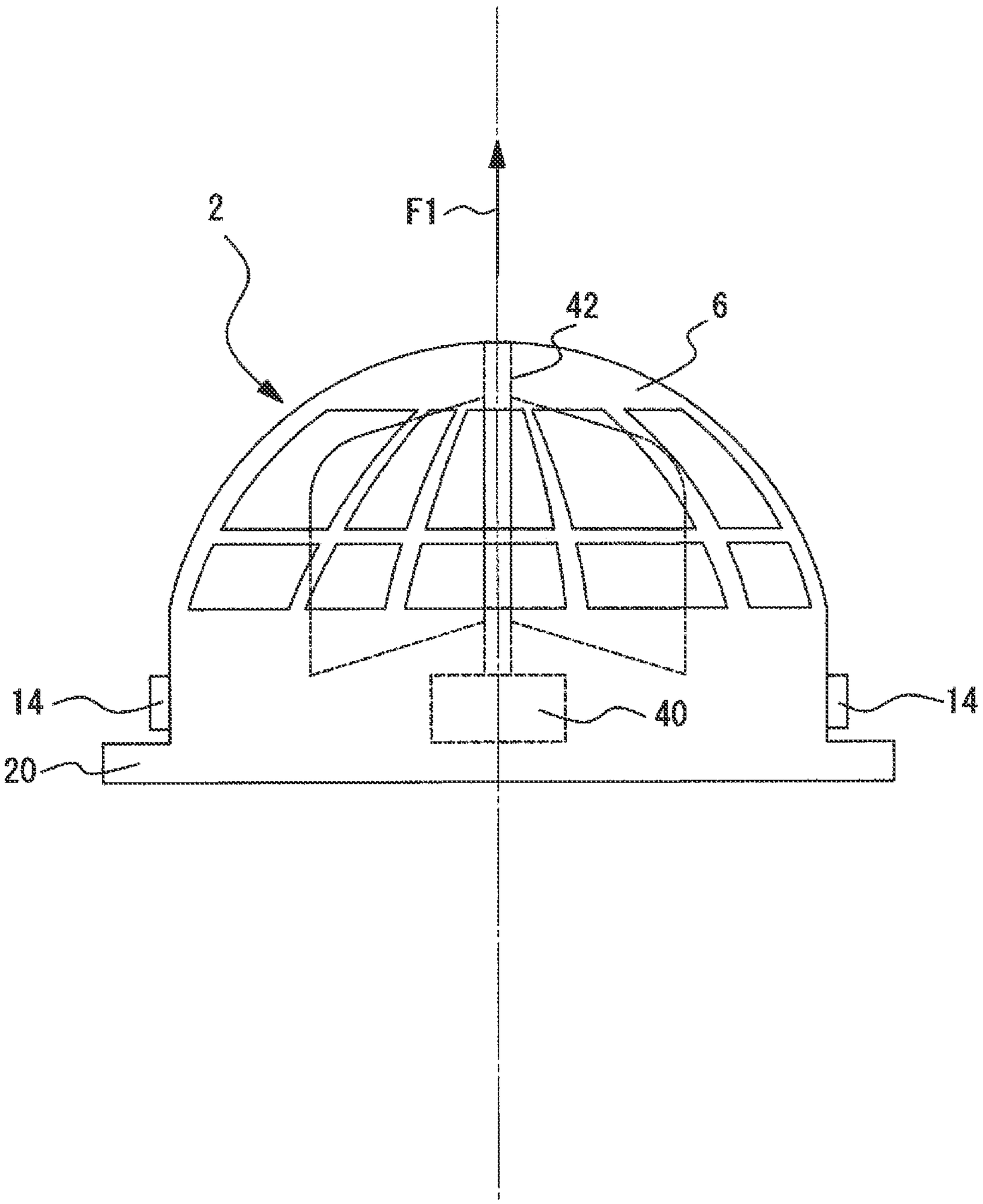


Fig. 7

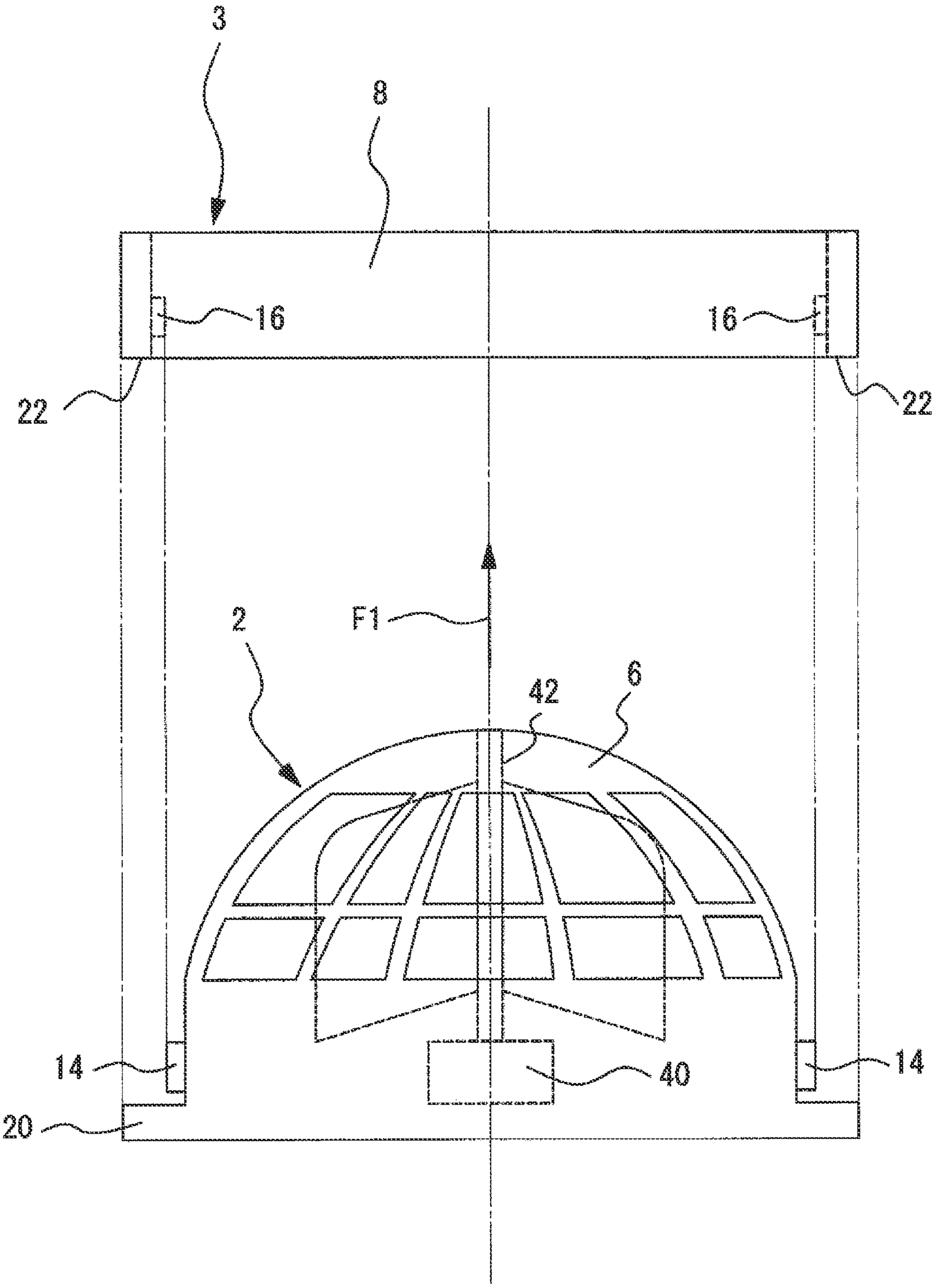


Fig. 8

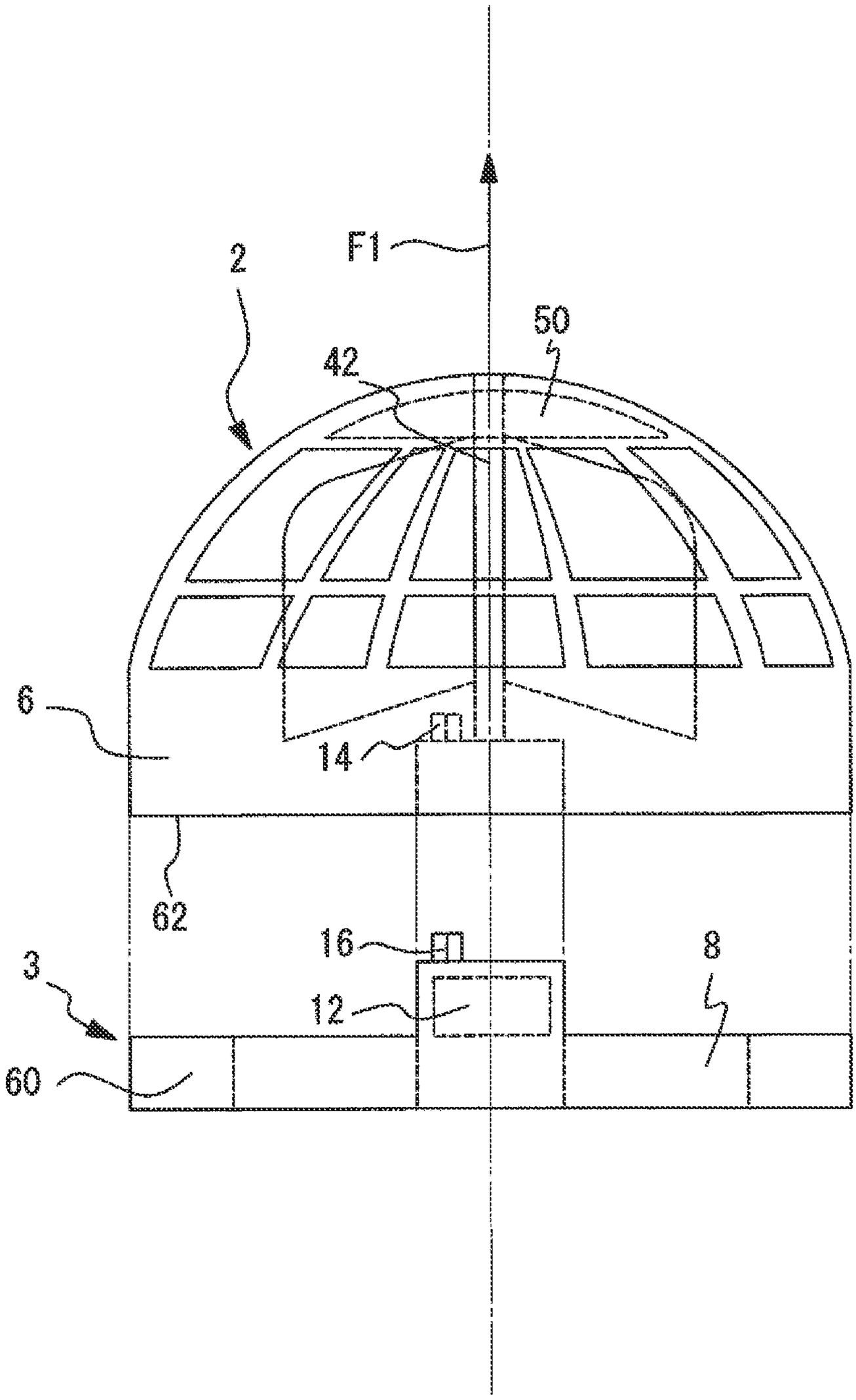


Fig. 9

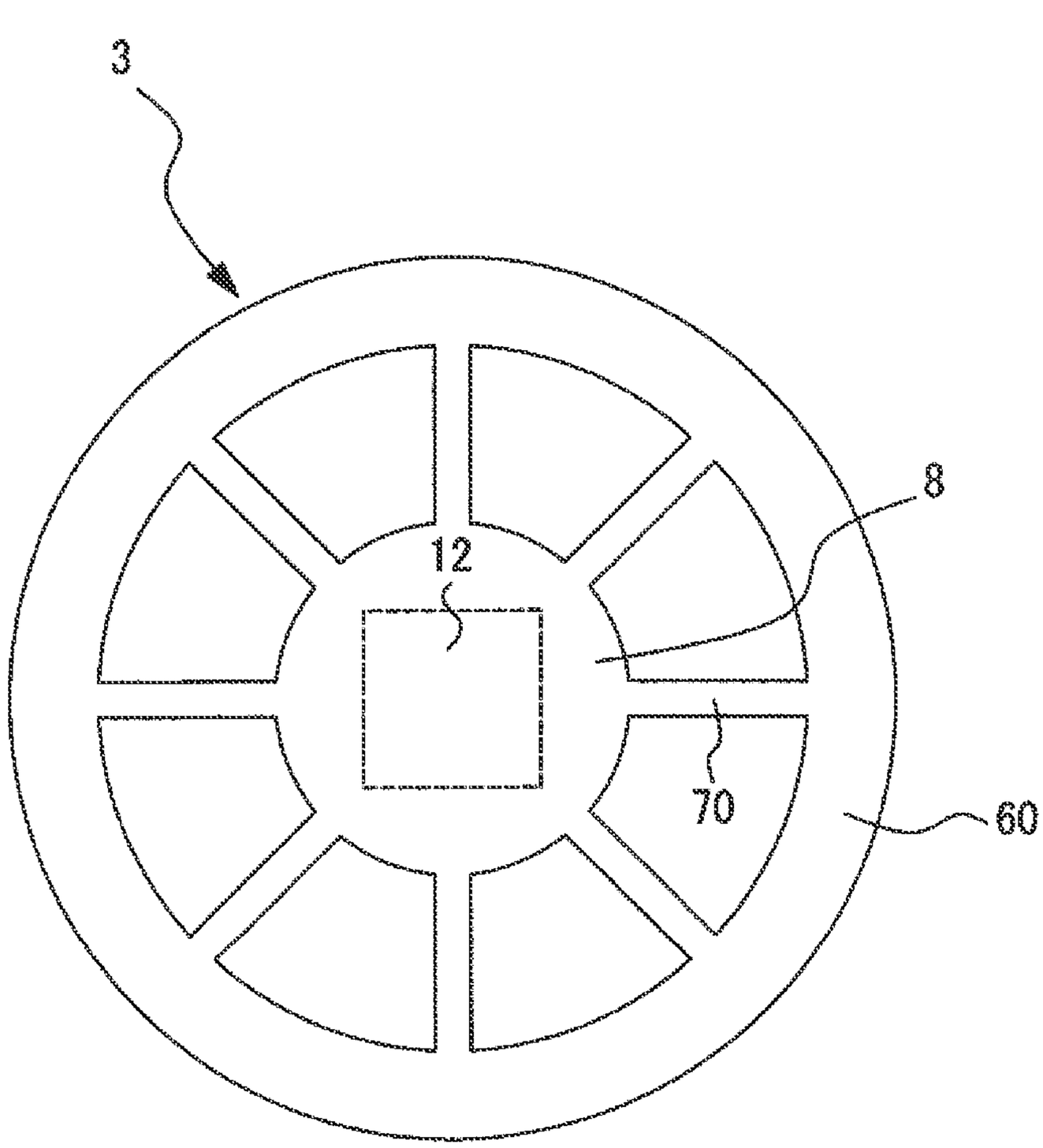


Fig. 10

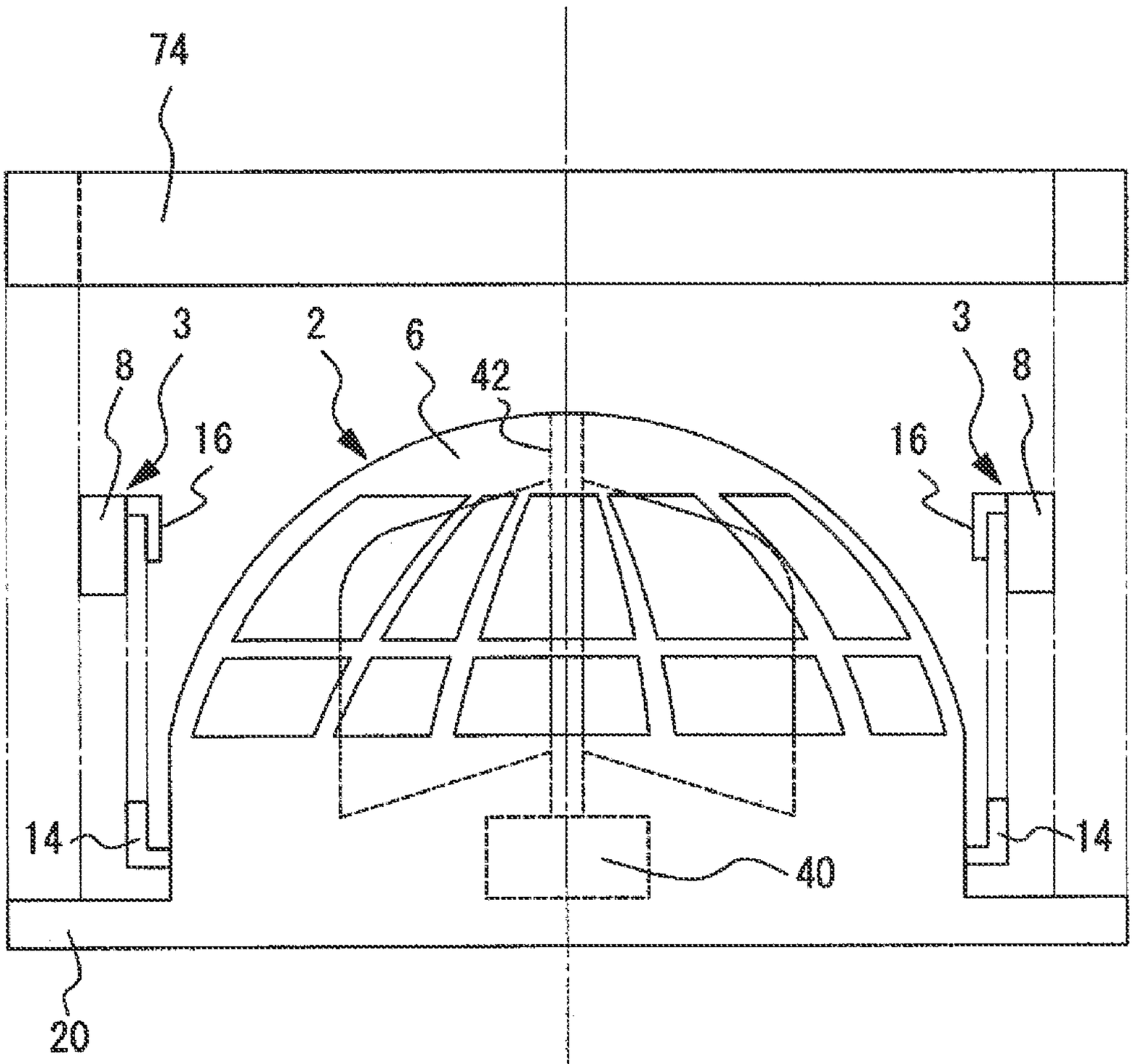


Fig 11

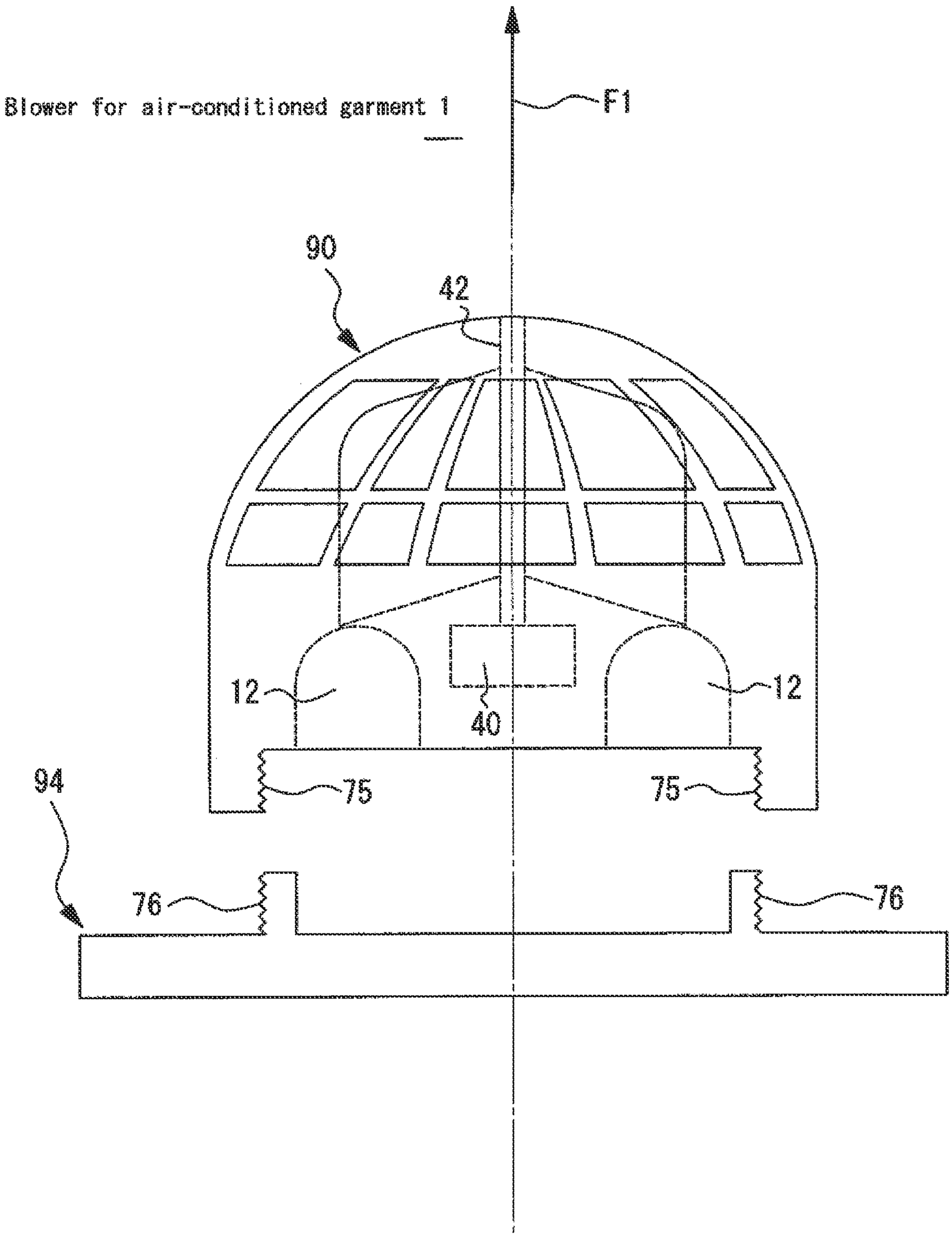

Blower for air-conditioned garment 1
F1
90
42
12
40
12
75
75
94
76
76

Fig. 12

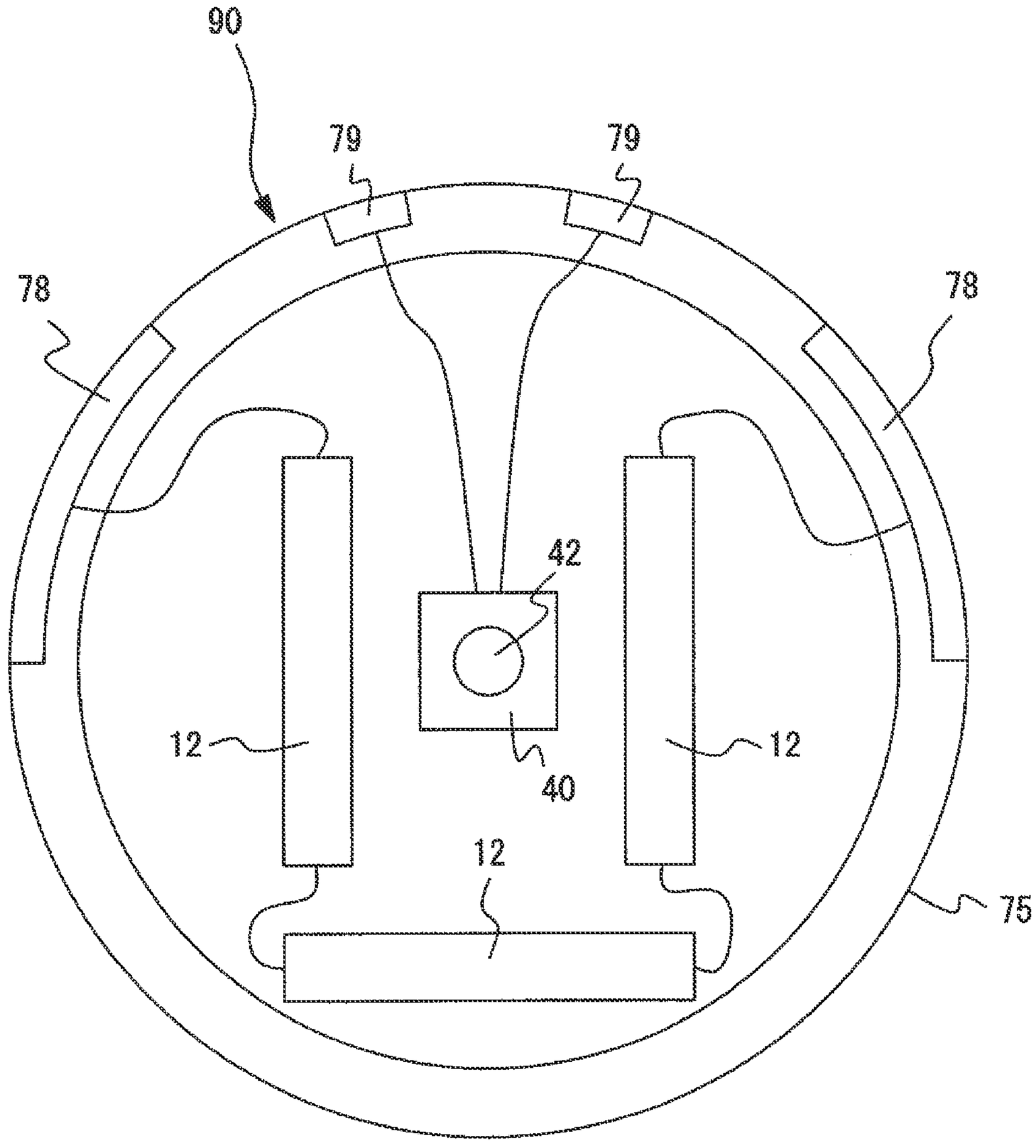


Fig. 13

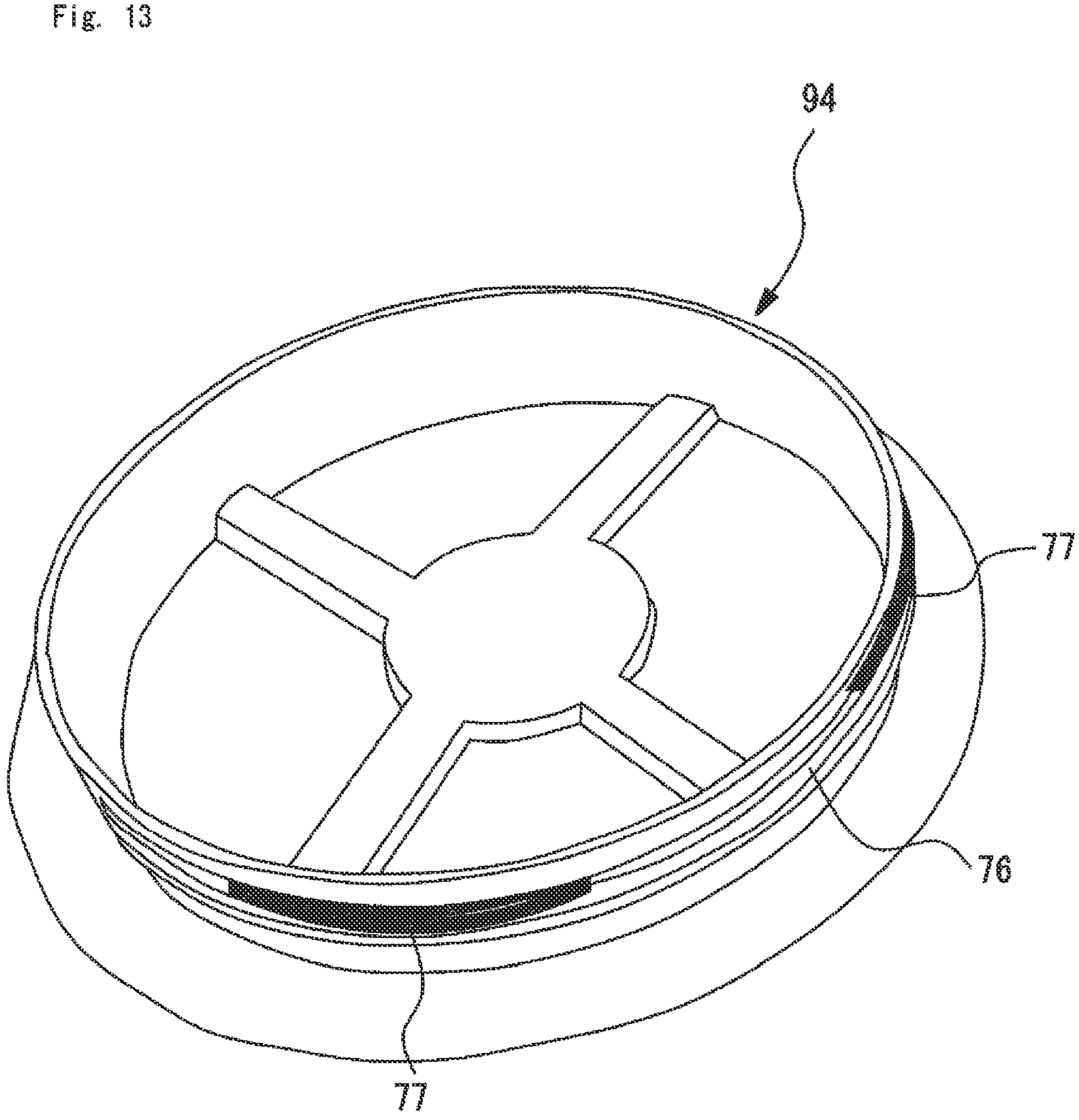


Fig. 14

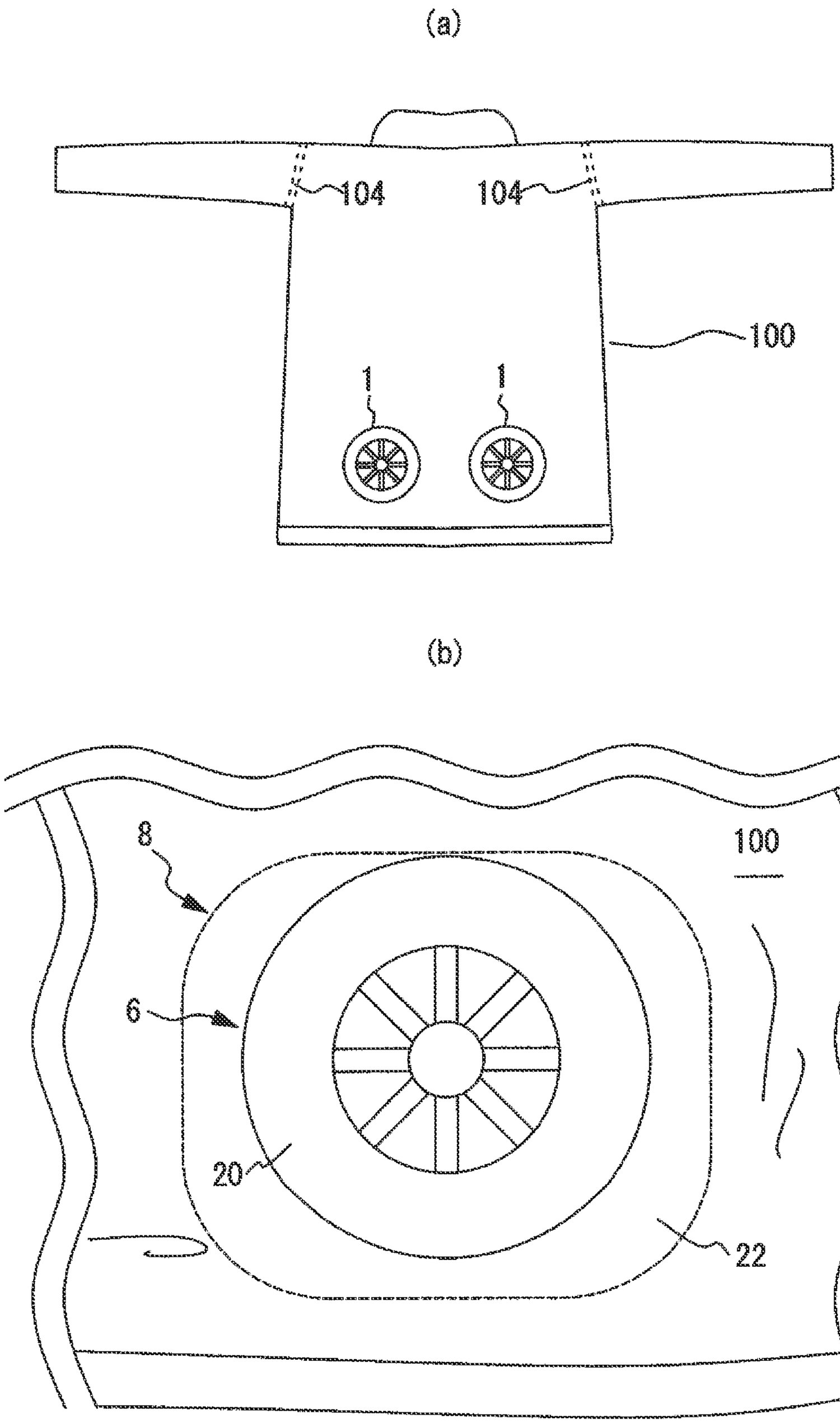


Fig. 15

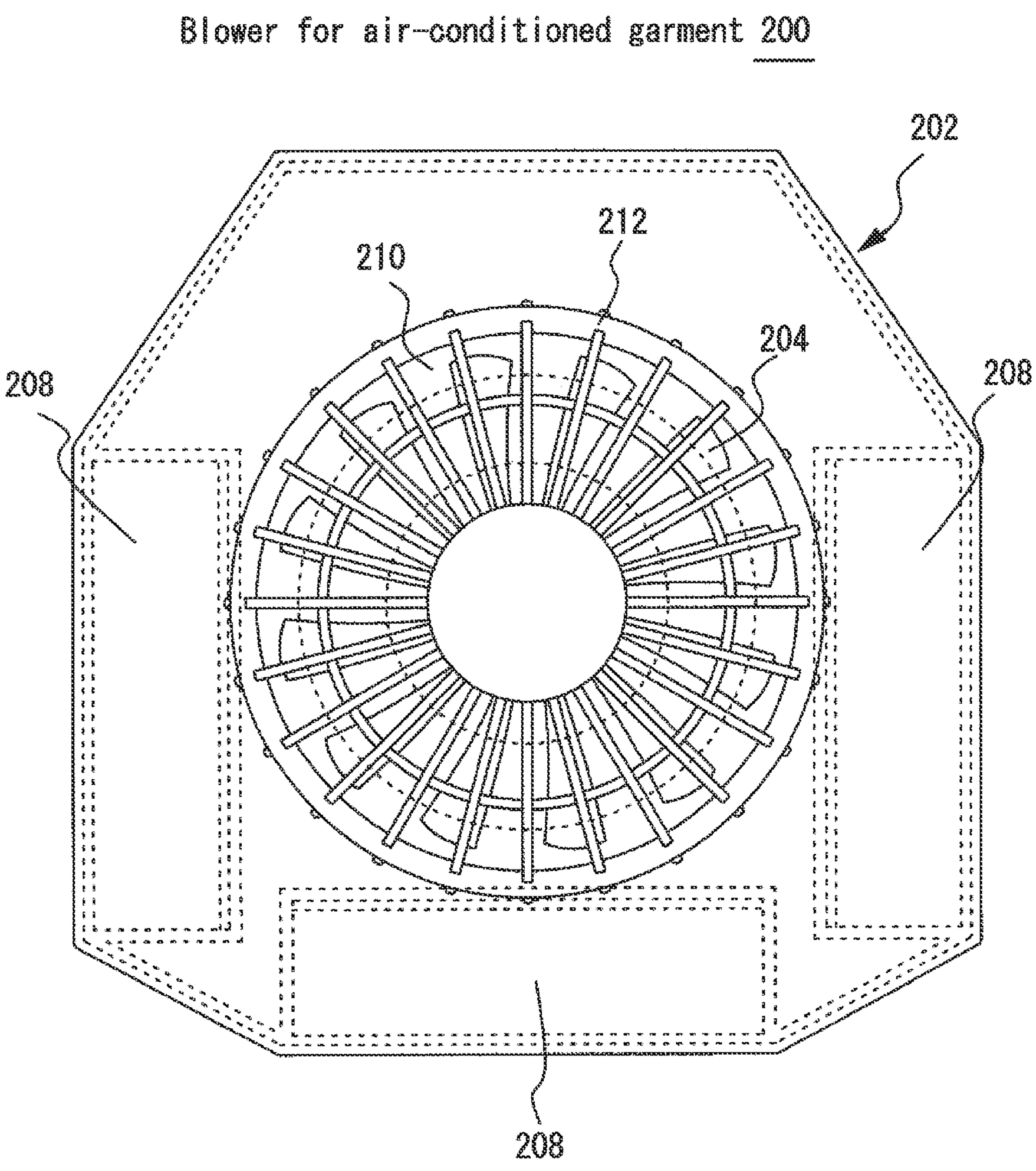

Blower for air-conditioned garment 200
202
212
210
204
208
208
208

Fig. 16

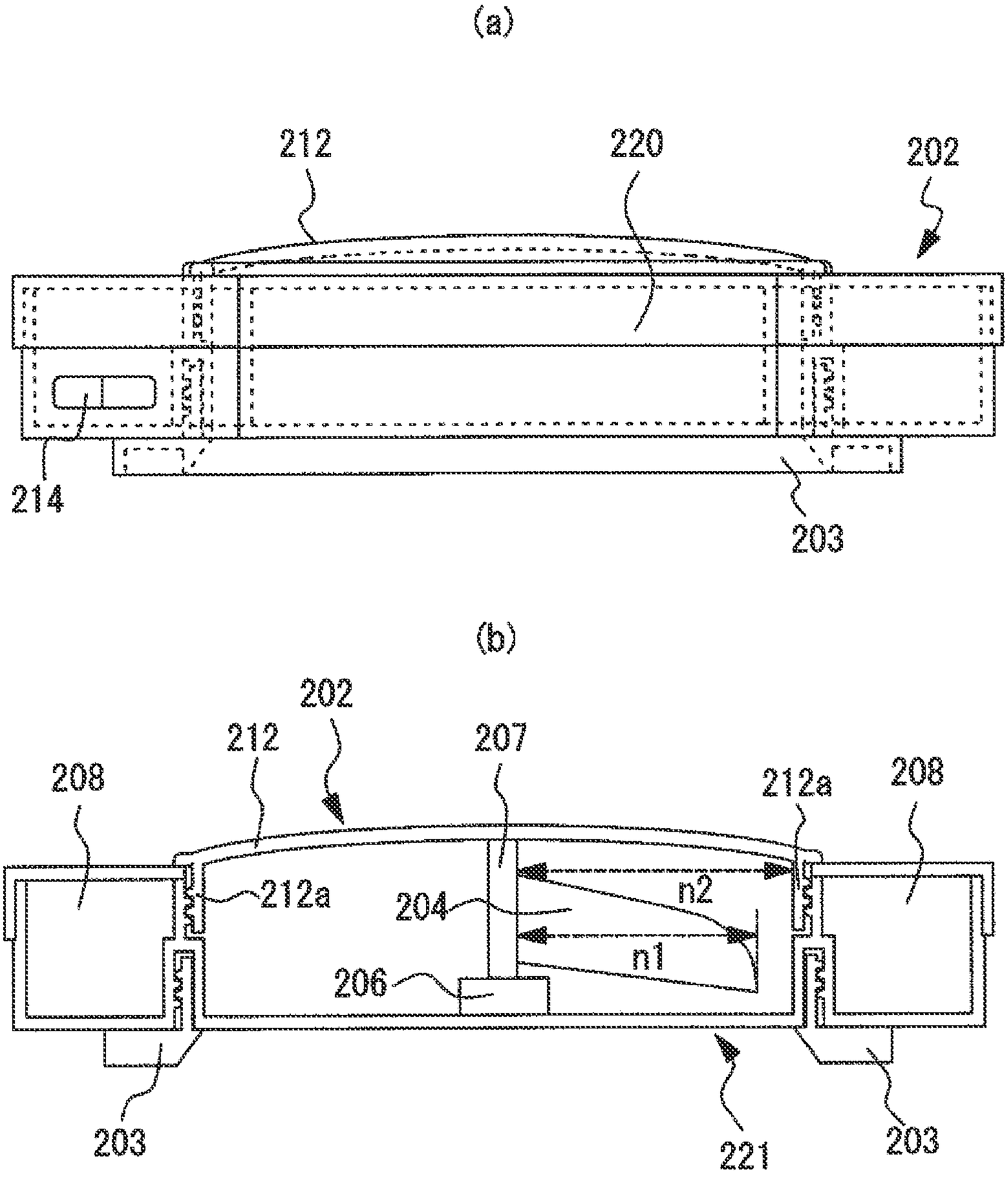

(a)
212
220
202
214
203
(b)
202
208
212
207
212a
208
212a
204
n2
n1
206
203
221
203

Fig. 17

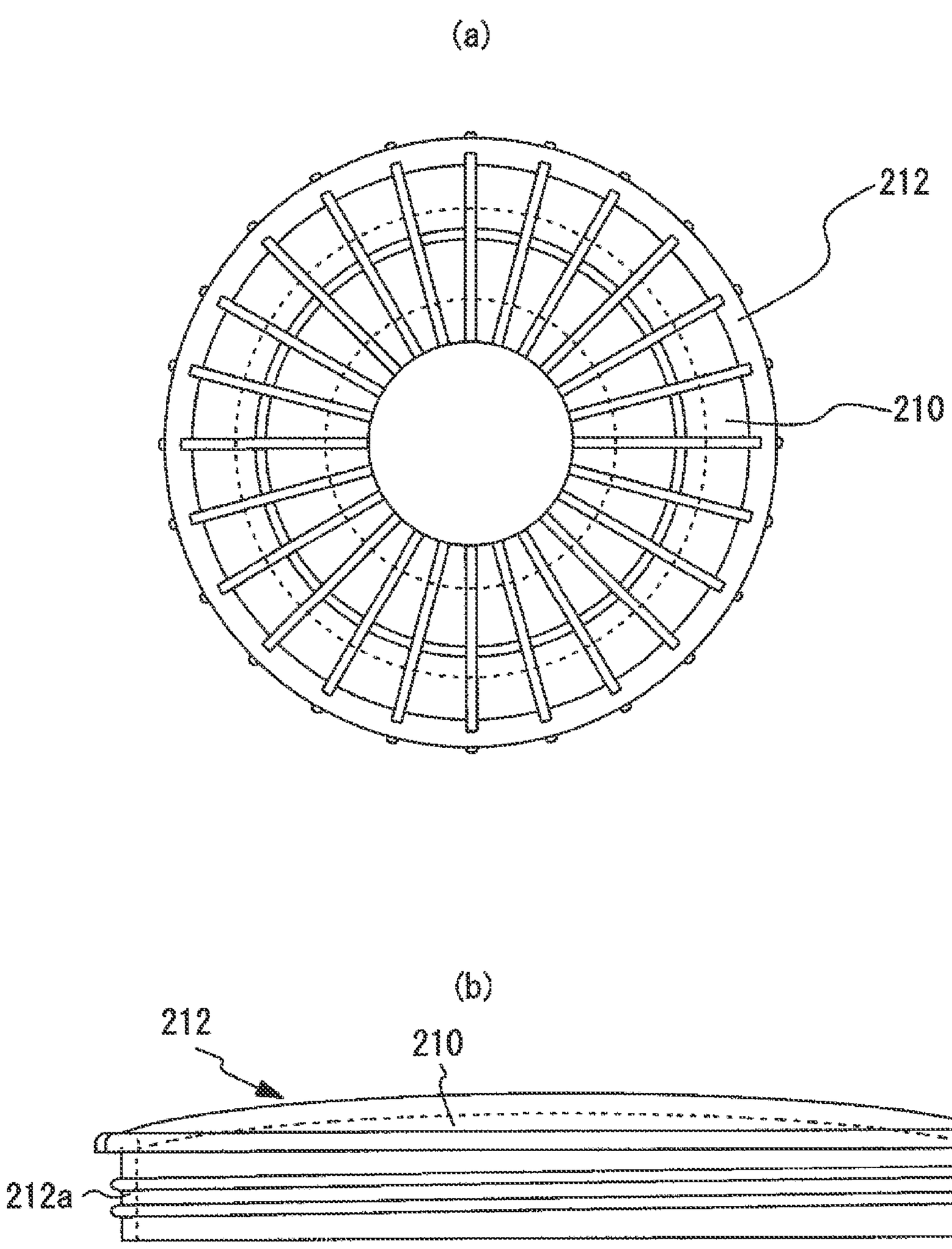


Fig. 18

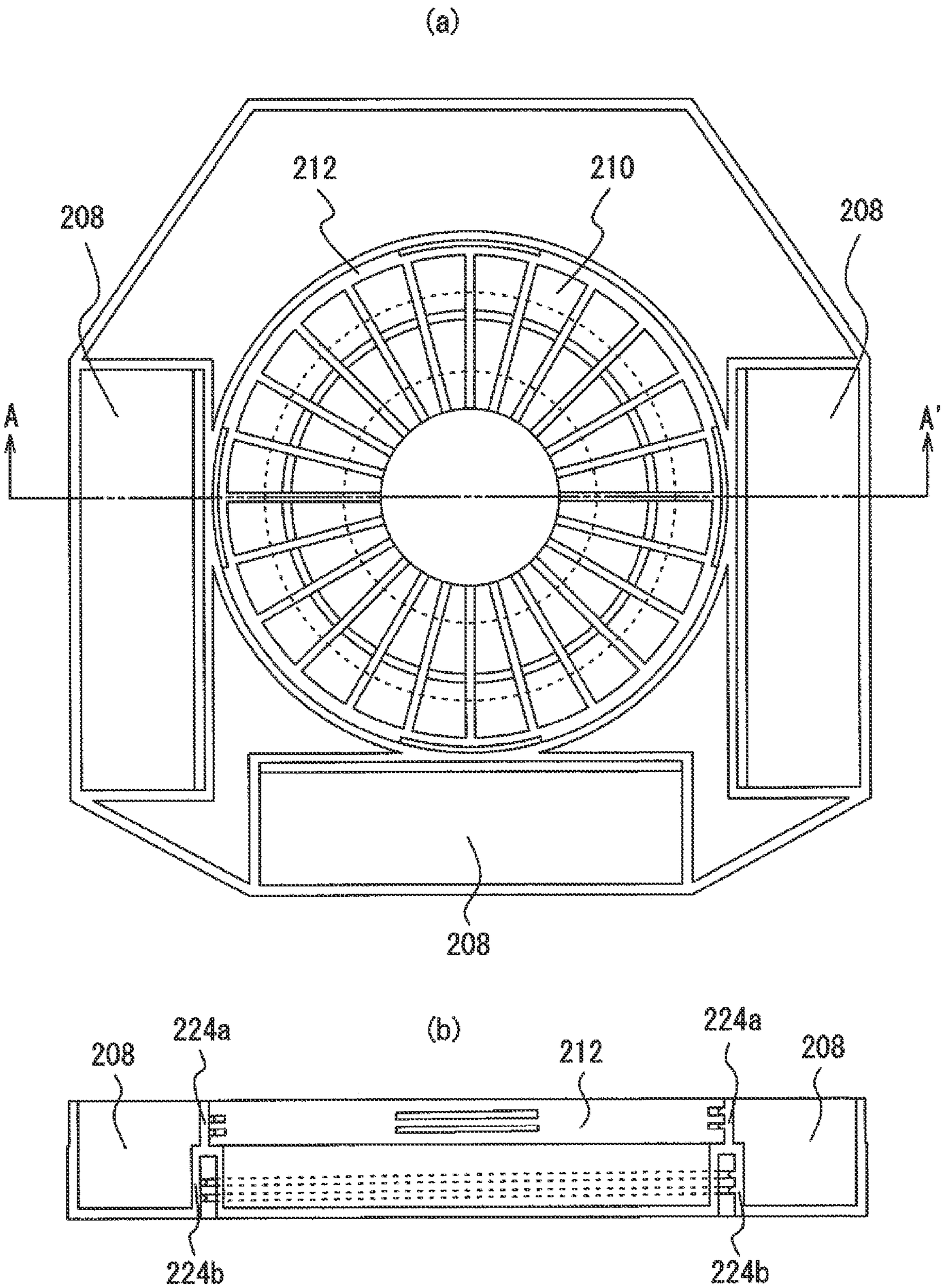
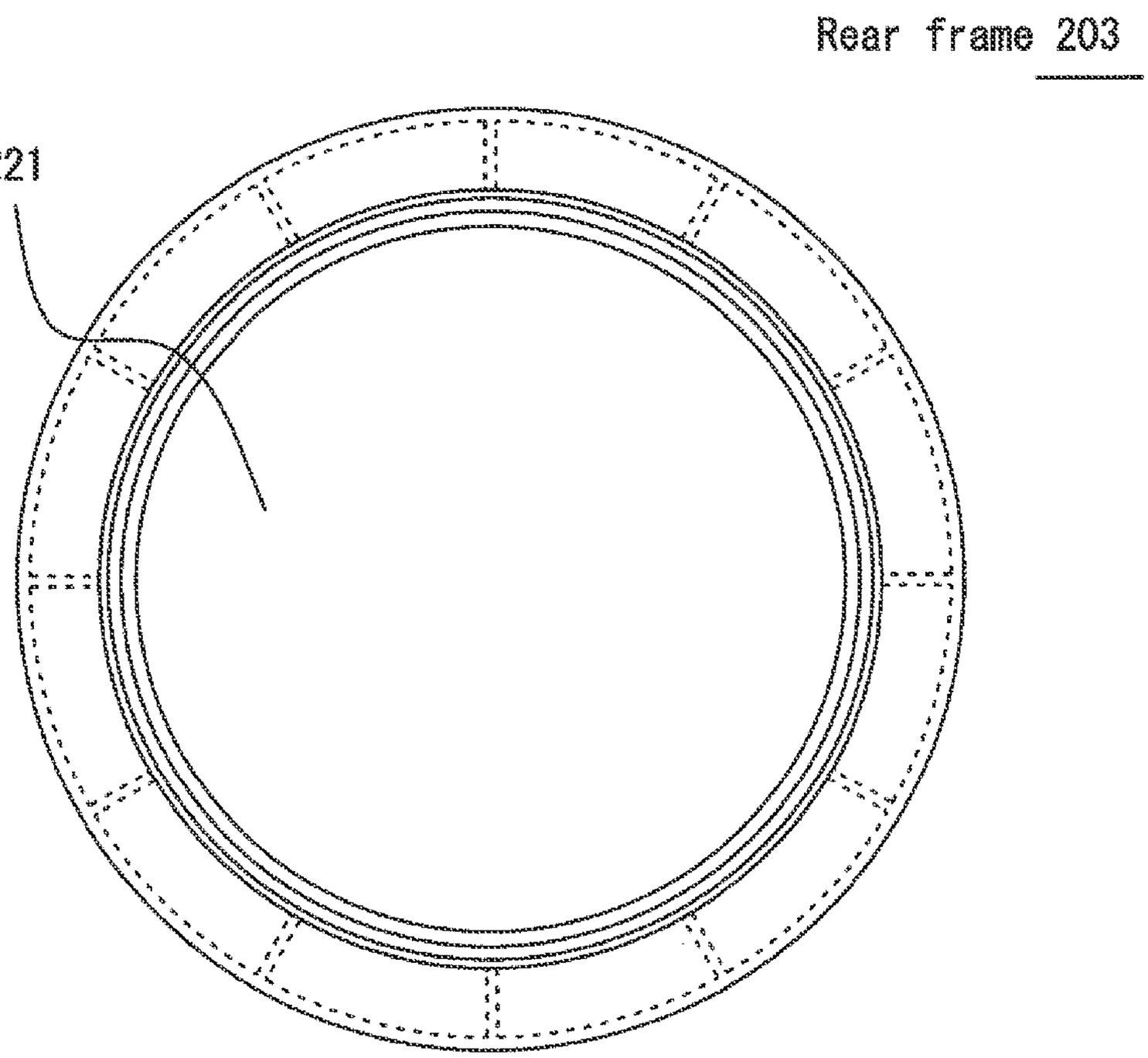


Fig. 19

(a)



(b)

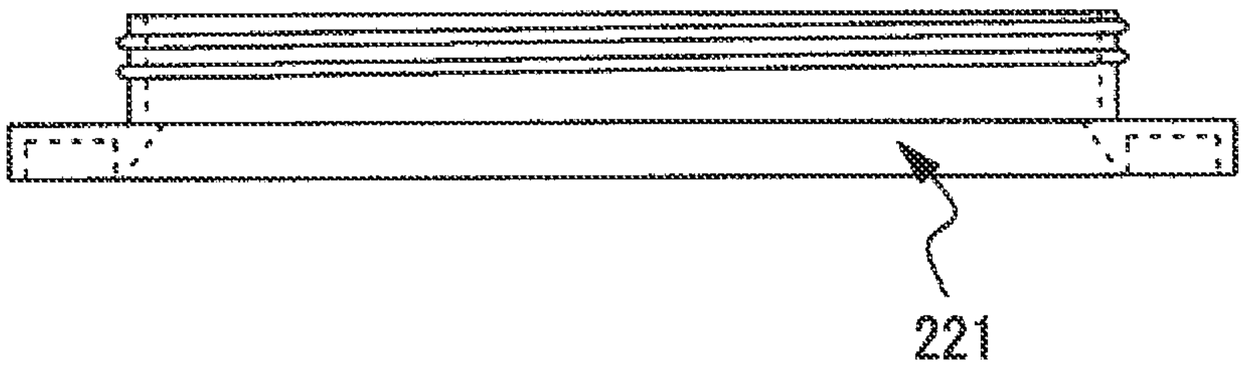


Fig. 20

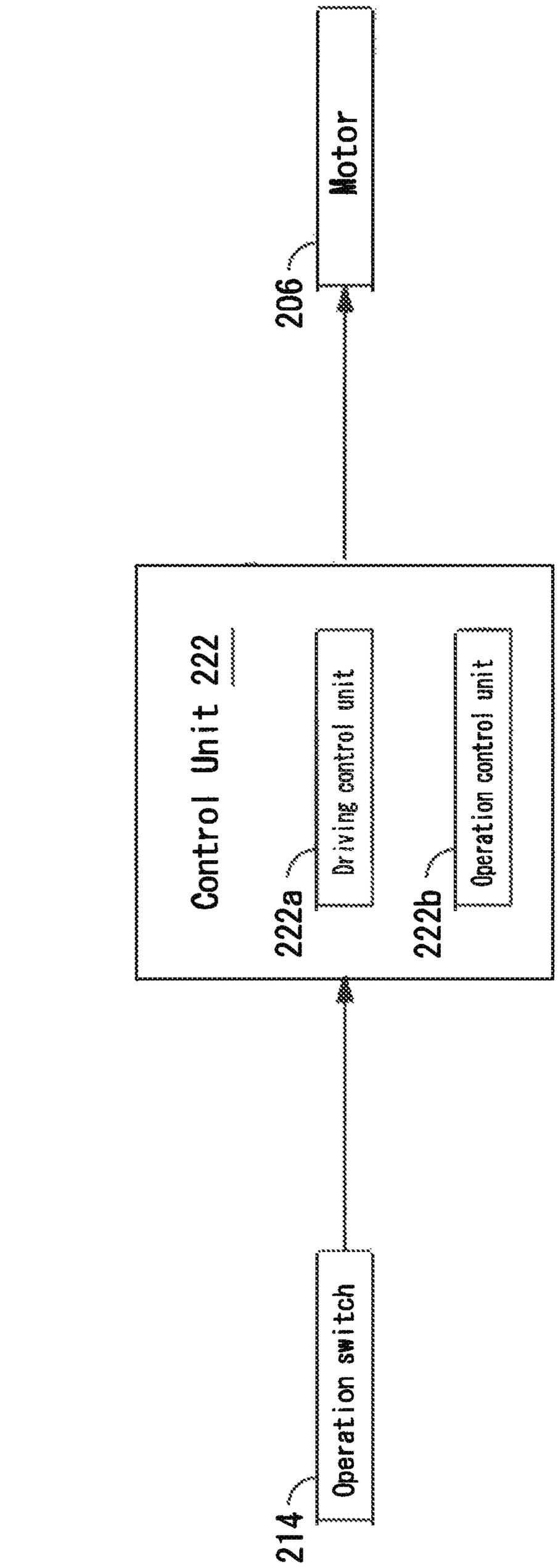

Motor
206
Control Unit 222
222a
Driving control unit
222b
Operation control unit
Operation switch
214

Fig. 21

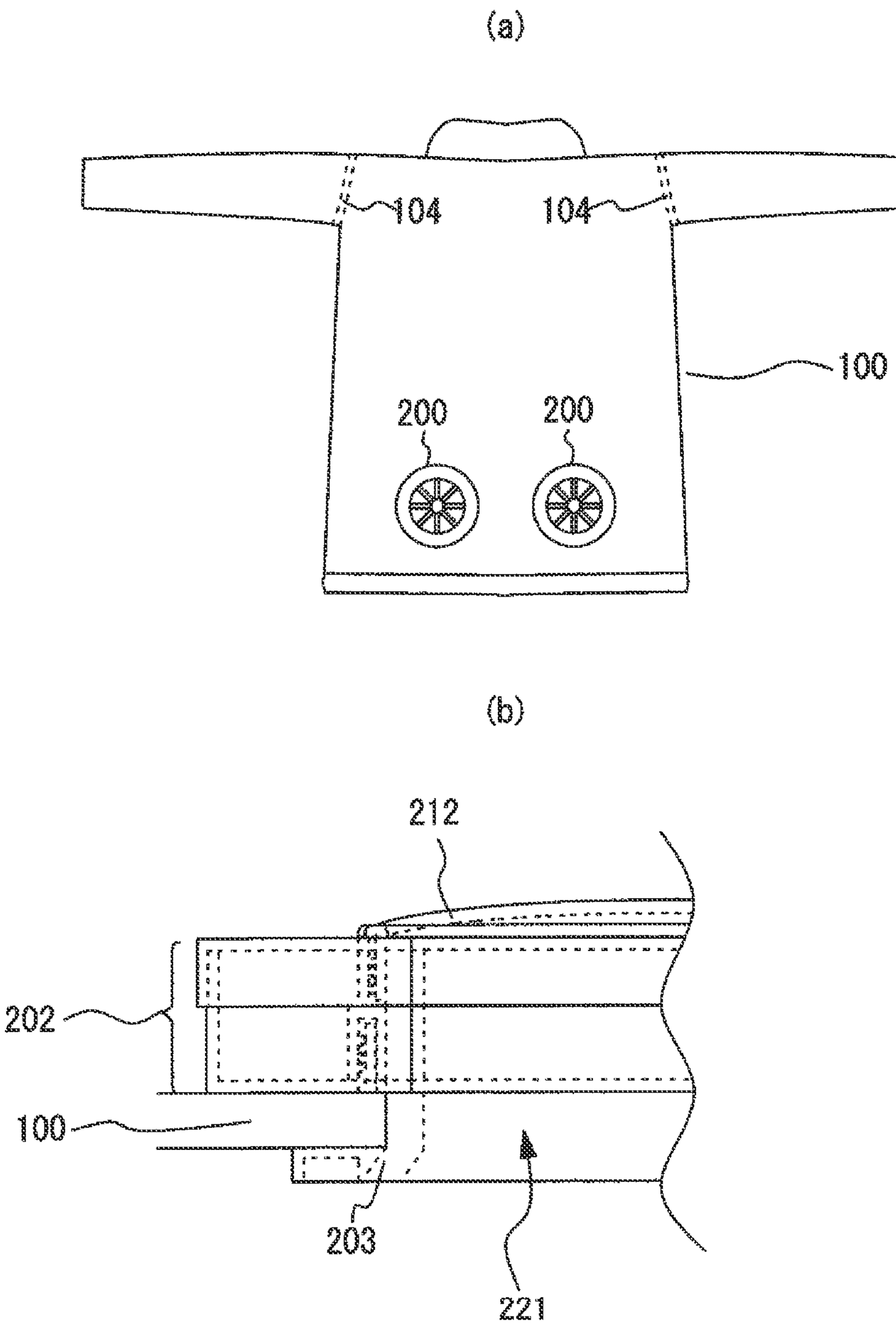


Fig. 22

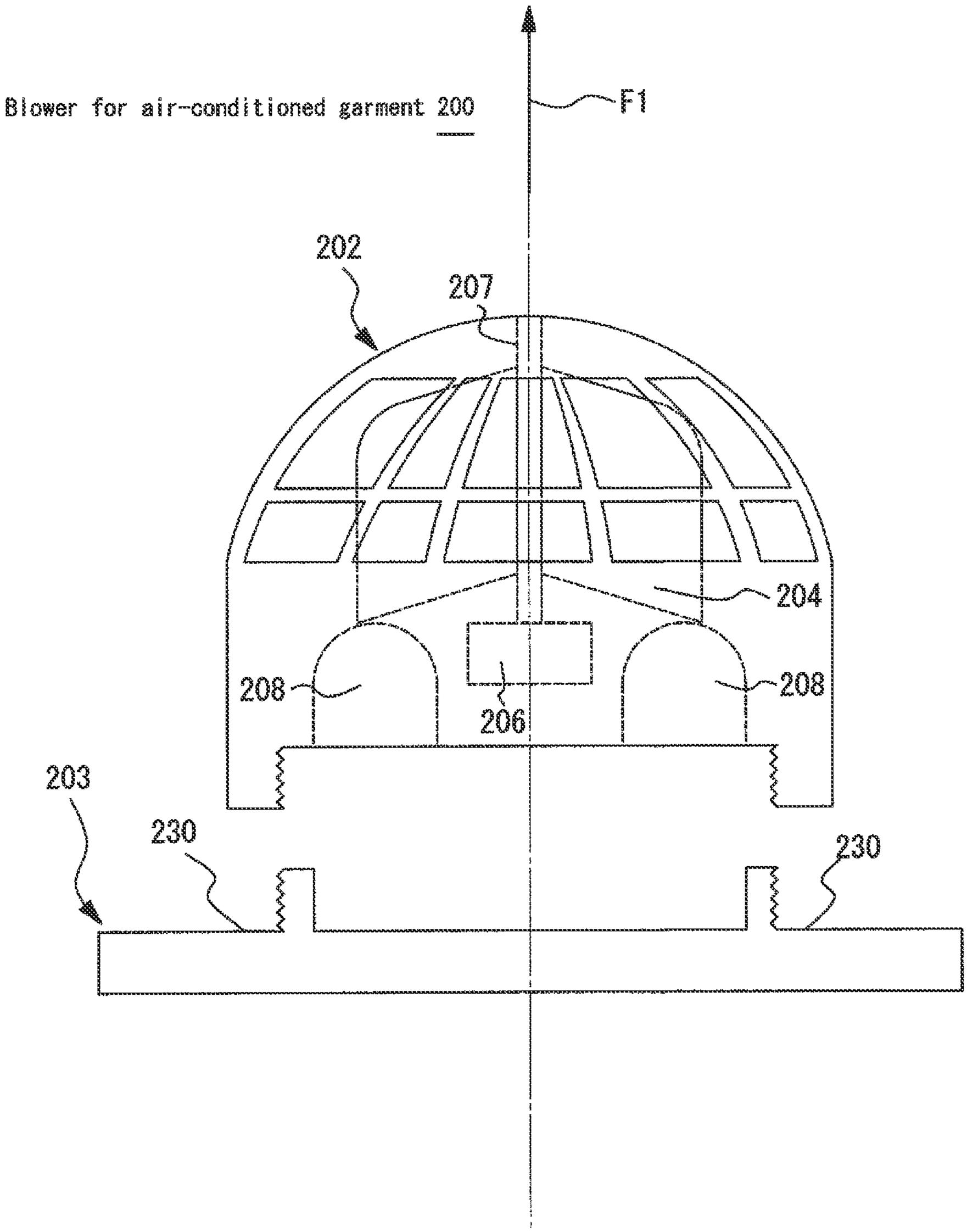
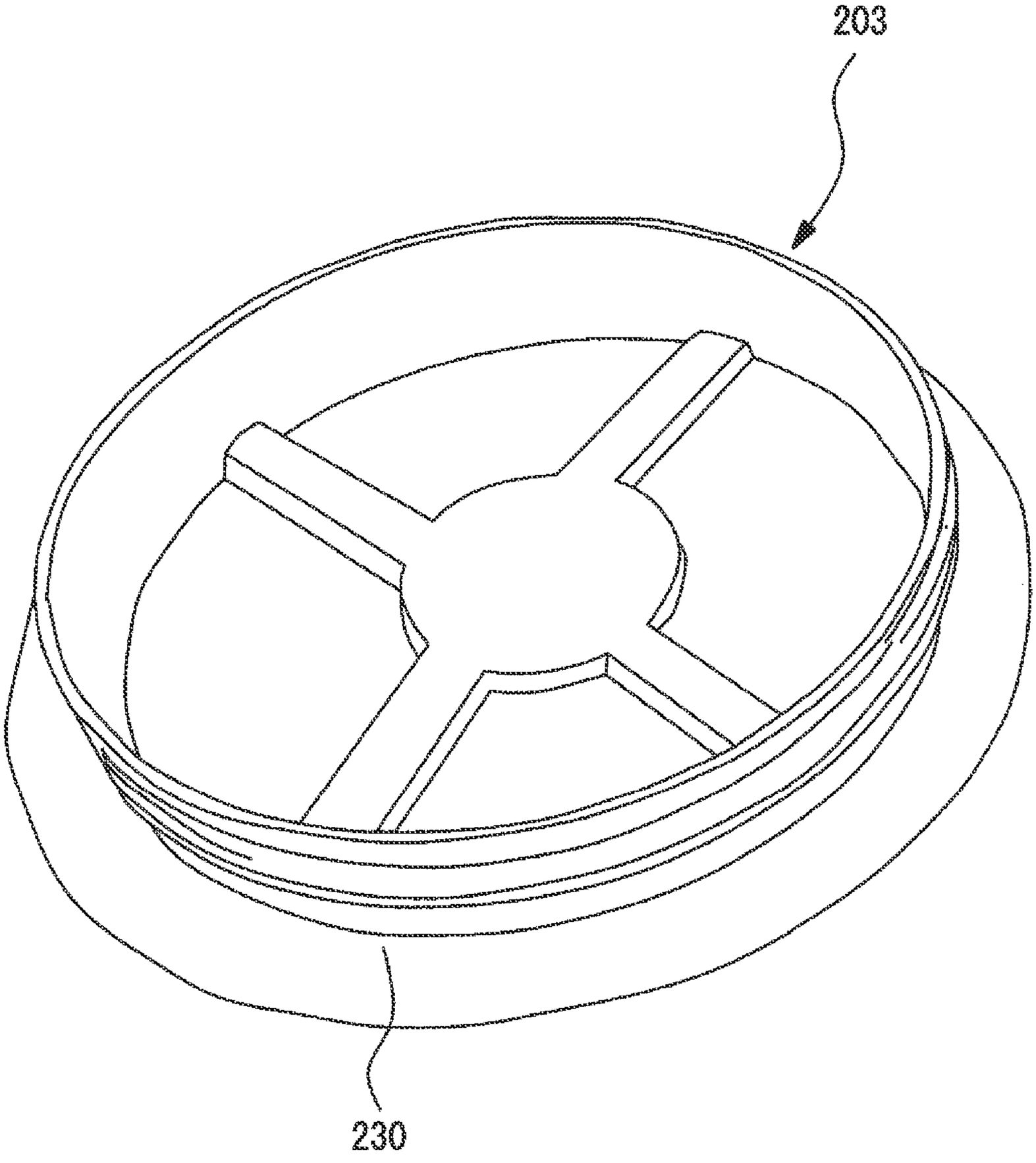

Blower for air-conditioned garment 200
F1
202
207
204
208
208
206
203
230
230

Fig. 23



BLOWER FOR AIR-CONDITIONED GARMENT AND AIR-CONDITIONED GARMENT

CROSS REFERENCE TO RELATED APPLICATIONS

This application is a U.S. national stage application of International Patent Application No. PCT/JP2019/037154 filed on Sep. 23, 2019 which claims priority to Japanese Patent Application No. 2018-196155 filed on Oct. 17, 2018 and Japanese Patent Application No. 2019-071854 filed on Apr. 4, 2019 the disclosures of which are incorporated herein by reference.

TECHNICAL FIELD

The present application relates to a blower for an air-conditioned garment and an air-conditioned garment, and particularly to a power supply technology.

BACKGROUND

Hitherto, as power supplying means for supplying power to a fan that is blowing means, a blower in which a housing that stores a secondary battery therein and the fan are connected to each other by a cable has been provided (for example, Patent Literature 1). When this related-art blower is installed on an air-conditioned garment, the fan that is the blowing means is mounted on a mounting hole formed in the air-conditioned garment, and the housing that stores the secondary battery therein is accommodated in a pocket and the like of the air-conditioned garment. The power to the fan is supplied from the secondary battery via the cable.

PATENT LITERATURE

Patent Literature 1: International Publication No. WO 2005/082182

According to the blower disclosed in Patent Literature 1 above, there is an advantage in that a wearer of the air-conditioned garment can freely move in a state in which the blower is operating. However, there has been a problem in that cables or cable terminals disposed in the air-conditioned garment are easily damaged because the air-conditioned garment deforms by the movement of the wearer.

SUMMARY

Thus, in order to solve the above-mentioned related-art problem, an object is to provide a blower for an air-conditioned garment and an air-conditioned garment that enable stable supplying of power to the blower through suppression of damage to cables or cable terminals.

In order to achieve the above-mentioned object, a blower is provided that includes: a blower unit having a fan driven by a motor; and a power supply unit that supplies power to the blower unit. In the blower for the air-conditioned garment, the blower unit includes a first housing that houses the fan, the power supply unit includes a second housing that houses a battery, the first housing includes: a first contact part through which the power supplied by the power supply unit is able to be supplied; and a first flange that extends outside of an end part, the second housing includes: a through hole in which the first housing is insertable in a rotation shaft direction of the fan; a plurality of holding parts that each house the battery; a second contact part that is arranged in a position corresponding to the first contact part and abuts the first contact part; and a first receiving part that abuts the first flange when being engaged with the first housing, the first housing and the second housing each have a shape detachably engageable with each other, and sandwich a peripheral edge of a mounting hole formed in the air-conditioned garment between the first flange and the first receiving part when the first housing and the second housing are engaged with each other, and the plurality of holding parts are arranged in predetermined regions that are unevenly distributed on a periphery of the through hole.

In the blower for the air-conditioned garment, the first housing further includes an accommodation part capable of accommodating a medical agent, and the accommodation part is disposed on a front side of the fan in a flow direction of gas.

In another embodiment, a blower includes: a blower unit having a fan driven by a motor; and a power supply unit that supplies power to the blower unit. In the blower for the air-conditioned garment, the blower unit includes a first housing that houses the fan, the power supply unit includes a second housing including: a holding part that houses a battery; and a through hole in which the first housing is insertable in a rotation shaft direction of the fan, the first housing includes a first contact part through which the power supplied by the power supply unit is able to be supplied, the second housing includes: a second contact part that is arranged in a position corresponding to the first contact part and abuts the first contact part; and an accommodation part capable of accommodating a medical agent, the first housing and the second housing each have a shape detachably engageable with each other, and the accommodation part is disposed on an outer side with respect to an outer diameter of the fan in the rotation shaft direction and has a ventilation part on a side facing the fan.

More specifically, an air-conditioned garment is provided on which the blower for the air-conditioned garment is mounted.

The air-conditioned garment may further include a ventilation adjustment part that is formed on a base end side of a sleeve part and able to adjust a ventilation quantity on an inner side of the sleeve part.

In another embodiment, a blower includes: a main body part including: a motor that drives a fan; and a power supply unit; and a rear cover that is engaged with the main body part, the blower being installable on the air-conditioned garment by separable engagement of the main body part and the rear cover. In the blower for the air-conditioned garment, the main body part includes: a third contact part that is connected to the power supply unit and through which power can be supplied; and a fourth contact part that is connected to the motor and through which power can be supplied, the rear cover includes an electrically-conductive part that abuts the third contact part and the fourth contact part, and the electrically-conductive part relays power supplied to the motor from the power supply unit by abutting the third contact part and abutting the fourth contact part when the main body part and the rear cover are engaged with each other.

In the blower for the air-conditioned garment, the main body part further includes a first locking part that is engaged with the rear cover, the rear cover further includes a second locking part that is engaged with the first locking part of the main body part, the third contact part and the fourth contact part are disposed in the first locking part so as to be separated from each other, and the electrically-conductive part is

disposed in a position in the second locking part corresponding to the third contact part, and the fourth contact part.

In another embodiment, a blower includes: a main body part including: a fan; and a motor that drives the fan; and a rear frame that is engaged with the main body part, the blower being installable on the air-conditioned garment by separable engagement of the main body part and the rear frame. In the blower for the air-conditioned garment, the main body part includes: a power supply unit that supplies power to the motor; a control unit that controls driving of the motor; and an operation input unit that inputs a signal to the control unit in accordance with operation of a user, the power supply unit includes a plurality of power supply units, each power supply unit being formed such that a distance between the power supply unit and a rotation shaft of the fan in a direction orthogonally intersecting the rotation shaft of the fan is longer than an outer diameter of the fan, each power supply unit being close to an outer periphery of the fan at a longitudinal side, the power supply units being unevenly distributed on a lower side near the outer periphery of the fan, and the main body part and the rear frame are formed so as to sandwich the air-conditioned garment between the main body part and the rear frame.

In the blower for the air-conditioned garment, the rear frame includes a suction port that sucks in gas, and the suction port has an inner diameter that gradually expands toward a rear side in a flow direction of the gas.

In the blower for the air-conditioned garment, the main body part further includes: a through hole that houses the fan in a rotation shaft direction of the fan; and a fan cover that detachably occludes the through hole on a front side with respect to the fan in a flow direction of gas.

In the blower for the air-conditioned garment, the fan cover includes an engaging part that is engaged with an inner peripheral side surface of the through hole, and a length from the rotation shaft to an inner peripheral wall of the engaging part is longer than the outer diameter of the fan when the fan cover is engaged with the inner peripheral side surface.

In the blower for the air-conditioned garment, the fan cover further includes an exhaust, port formed on the front side in the flow direction of the gas so as to be continuous with the engaging part, and the exhaust port has an inner periphery that expands to an outer side from the inner peripheral wall of the engaging part.

In another embodiment, a blower for an air-conditioned garment includes: an axial fan that causes gas to flow in a rotation shaft direction; and a motor that drives the axial fan; and a rear frame that is engaged with the main body part, the blower being installable on the air-conditioned garment by separable engagement of the main body part and the rear frame. In the blower for the air-conditioned garment, the main body part includes: a power supply unit that supplies power to the motor; a control unit that controls driving of the motor; and an operation input unit that inputs a signal to the control unit in accordance with operation of a user, the power supply unit includes a plurality of power supply units, each power supply unit being formed such that a distance between the power supply unit and a rotation shaft of the axial fan in a direction orthogonally intersecting the rotation shaft of the axial fan is longer than an outer diameter of the axial fan, the power supply units being disposed so as to surround the axial fan in an unevenly distributed manner on a lower side of the axial fan, and the main body part and the rear frame are formed so as to sandwich the air-conditioned garment between the main body part and the rear frame.

Accordingly, the power can be stably supplied to the blower by engaging the blower unit and the power supply unit with each other.

BRIEF DESCRIPTION OF DRAWINGS

FIG. **1** is a front view of a blower for an air-conditioned garment in a first embodiment.

FIG. **2** is a side view of the blower for the air-conditioned garment in the first embodiment.

FIG. **3** is a perspective view of a power supply unit in the first embodiment.

FIG. **4** is a front view of the power supply unit in the first embodiment.

FIG. **5** is an enlarged view of the power supply unit in the first embodiment.

FIG. **6** is a side view of a blower unit in the first embodiment.

FIG. **7** illustrates one example of the configuration of the blower for the air-conditioned garment in the first embodiment.

FIG. **8** illustrates one example of the configuration of a blower for an air-conditioned garment in a second embodiment.

FIG. **9** is a rear view of a power supply unit in the second embodiment.

FIG. **10** illustrates one example of the configuration of a blower for an air-conditioned garment in a third embodiment.

FIG. **11** illustrates one example of the configuration of a blower for an air-conditioned garment in a fourth embodiment.

FIG. **12** is a front view of a blower unit in the fourth embodiment.

FIG. **13** is a perspective view of a rear cover in the fourth embodiment.

FIG. **14** illustrates one example of installation of the blower for the air-conditioned garment onto the air-conditioned garment.

FIG. **15** illustrates one example of the configuration of the blower for the air-conditioned garment in a fifth embodiment.

FIG. **16** is a side view of the blower for the air-conditioned garment in the fifth embodiment.

FIG. **17** illustrates one example of the configuration of a fan cover in the fifth embodiment.

FIG. **18** illustrates one example of the configuration of the blower for the air-conditioned garment in the fifth embodiment.

FIG. **19** illustrates one example of the configuration of a rear frame in the fifth embodiment.

FIG. **20** is a block diagram illustrating one example of the functional configuration of a control unit in the fifth embodiment.

FIG. **21** illustrates one example of the configuration of the air-conditioned garment in the fifth embodiment.

FIG. **22** is a cross-sectional view illustrating one example of the configuration of the blower for the air-conditioned garment in the fifth embodiment.

FIG. **23** illustrates one example of the configuration of the rear frame in the fifth embodiment.

DETAILED DESCRIPTION

Preferable embodiments of the present invention are described in detail below with reference to the drawings. In the drawings referred to below, members common through-

out the drawings are denoted by the same reference characters and overlapping descriptions regarding those members are omitted.

First Embodiment

FIG. **1** is a front view illustrating a blower **1** for an air-conditioned garment in a first embodiment of the present invention. The blower **1** for the air-conditioned garment is used by being installed on an air-conditioned garment **100**. The blower **1** for the air-conditioned garment is installed on the air-conditioned garment **100** by being inserted in a mounting hole formed in the air-conditioned garment **100**. The blower **1** for the air-conditioned garment includes an axial blower and a centrifugal blower. The blower **1** for the air-conditioned garment includes a blower unit **2** having a fan driven by a motor, and a power supply unit **3** that, supplies power to the blower unit **2**.

The blower unit **2** includes the fan, the motor that drives the fan, and a first housing **6** that houses the fan and the motor. The first, housing **6** is made of resin to have a circular shape in a front view and houses the motor and the fan. The first housing **6** includes first contact parts **14** through which the power supplied by the power supply unit **3** can be supplied. The fan is joined to a rotation shaft **42**.

The first contact parts **14** are made of metal plates through which power can be supplied. The first contact parts **14** can be disposed in desired positions in the first housing **6** and are preferably disposed in positions close to a second housing **8** included in the power supply unit **3**. The first contact parts **14** may be integrally formed with the first housing **6** or may be separable from the first housing **6**.

The power supply unit **3** includes the second housing **9** that can house batteries. The second housing **8** has a substantially rectangular shape in a front view. The second housing **8** has a through hole that passes through the second housing **8** from the front surface side to the rear surface side. The through hole has a shape in which the first housing **6** can be inserted and preferably has a shape that can be engaged with the first housing **6** when the first housing **6** is inserted in the through hole.

The second housing **8** includes a plurality of holding parts **12** that each house a battery **10**. The batteries **10** are composed of storage batteries, for example. The second housing **8** includes second contact parts **16** for supplying power from the batteries **10** to the motor housed in the first housing **6**. The second contact parts **16** are made of metal plates and the like through which power can be supplied. The second contact parts **16** are disposed in positions corresponding to the first contact parts **14**. The second contact parts **16** abut the first, contact parts **14** when the first housing **6** and the second housing **8** are engaged with each other. In the illustrated example, the second contact parts **16** are disposed in positions corresponding to the first contact parts **14** on a peripheral edge of the through hole formed in the second housing **8**. The second contact parts **16** may be integrally formed with the second housing **8** or may be separable from the second housing **8**.

FIG. **2** is a side view of the blower **1** for the air-conditioned garment in the first embodiment. The blower unit **2** is detachably engaged with the power supply unit **3**. The blower unit **2** is engaged with the power supply unit **3** when the first housing **6** is inserted in the through hole formed in the second housing **8** of the power supply unit **3**.

The first housing **6** includes a flange **20**. The flange **20** is formed on the rear side of the first housing **6** when seen from an airflow direction F**1** when the fan is rotated. The flange **20** is formed so as to extend outside of an outer edge of the first housing **6** on the rear side thereof.

When the first housing **6** is inserted in the through hole formed in the second housing **3** from the airflow direction F**1**, the flange **20** abuts the peripheral edge of the through hole in the second housing **8**. In other words, the first housing **6** and the second housing **8** are engaged with each other by the abutment of the flange **20** and the peripheral edge of the through hole in the second housing **8**.

When the first housing **6** and the second housing **6** are engaged with each other, the second housing **8** is arranged on the outer side with respect to the outer diameter of the fan about the rotation shaft **42** in the first housing **6**. When the fan rotates about the rotation shaft **42**, air flows in the airflow direction F**1**. By arranging the second housing **8** on the outer side with respect to the outer diameter of the fan, the second housing **8** can be prevented from obstructing the flow of air.

When the first housing **6** and the second housing **8** are engaged with each other, the first contact parts **14** and the second contact parts **16** abut each other. As a result, power is supplied to the blower unit **2** from the power supply unit **3**, and the motor of the blower unit **2** is driven. Although not shown, the first contact parts **14** may be biased in a direction abutting the second contact, parts **16** by springs and the like. Alternatively, the second contact parts **16** may be biased in a direction abutting the first contact parts **14** by springs and the like instead. As a result, the first contact parts **14** and the second contact parts **16** abut each other in a more reliable manner, and power can be satisfactorily supplied therethrough.

When the fan rotates by the driving of the motor, air is sucked in from the outer side of the air-conditioned garment. **100** and is discharged into the air-conditioned garment **100** toward the airflow direction F**1**. The air discharged into the air-conditioned garment **100** is discharged to the outside from openings in sleeve parts and a neck part. In other words, the air in the air-conditioned garment **300** flows without stagnation, and hence removes heat from the skin surface of the wearer. As a result, an abnormal rise in the body temperature of the wearer can be prevented and heatstroke and the like car, be avoided.

FIG. **3** is a perspective view illustrating one example of the power supply unit **3** in the first embodiment. The second housing **8** has a through hole that passes through the second housing **8** in the thickness direction. The through hole has a shape that is substantially the same as that of the cross section of the first housing **6** in a front view, and the first housing **6** can be inserted therein.

The second housing **8** includes accommodation parts **32** that can each accommodate a medical agent. The accommodation parts **32** are provided on the peripheral edge of the through hole and are spaced apart from the through hole by a wall surface. The accommodation parts **32** each include a ventilation part **30** in the wall surface on the through hole side. The ventilation part **30** may be composed of a hole that passes through the wall surface or may be composed of breathable fiber. In the example illustrated in FIG. **3**, the ventilation parts **30** are notches formed in the wall surface that, spaces the accommodation parts **32** and the through hole apart from each other.

The accommodation parts **32** can house objects containing fiber such as cloth and cotton moistened with medical agents such as deodorant and insect repellent. Air flows in the accommodation parts **32** from the fan side or flows out from the accommodation parts **32** to the fan side via the ventilation parts **30**. The configurations, the functions, and the like of the ventilation parts **30** are described below.

FIG. **4** is a front view illustrating one example of the power supply unit **3** in the first embodiment. As described above, the second housing **8** has a through hole in the thickness direction at a place near the center. The second housing **3** includes the holding parts **12** that accommodate the batteries **10** on the peripheral edge of the through hole. The holding parts **12** are frames that each have a shape corresponding to the shape of the battery **10** and are integrally formed with the second housing **8**.

The holding parts **12** are disposed in the peripheral edge of the through hole by a plurality of numbers. The holding parts **12** are arranged such that the longitudinal direction thereof is close to the peripheral edge of the through hole. The holding parts **12** are arranged so as to be unevenly distributed on the peripheral edge of the through hole. As a result, when the blower **1** for the air-conditioned garment is mounted on the air-conditioned garment **100**, the blower **1** for the air-conditioned garment becomes stable in a state in which the holding parts **12** are positioned on the lower side by the weight of the batteries **10** housed in the holding parts **12**.

In other words, by the weight of the batteries **10** housed in the plurality of holding parts **12**, the center of gravity of the blower **1** for the air-conditioned garment becomes lower than the rotation shaft of the fan. Therefore, a case where the blower **1** for the air-conditioned garment itself rotates in accordance with the rotation of the fan can be satisfactorily suppressed.

In the examples illustrated in FIG. **3** and FIG. **4**, a case where the second housing **9** includes the plurality of holding parts **12** has been shown, but the second housing **8** may include one holding part **12** that can house the plurality of batteries **10** instead. As a result, worker hours for forming the second housing **8** can be reduced.

The second housing **8** includes the second contact parts **16** on an inner peripheral wall of the through hole. The second contact parts **16** are disposed in positions corresponding to the first contact parts **14** formed on the first housing **6**. The second contact parts **16** may be biased in a through-hole central-axis direction by springs and the like.

The second housing **8** includes the accommodation parts **32** that can each accommodate a medical agent on the peripheral edge of the through hole. As described above, the accommodation parts **32** are included on the peripheral edge of the through hole. The accommodation parts **32** are arranged so as to be positioned near the outer edge of the fan when the blower unit **2** and the power supply unit **3** are engaged with each other. The accommodation parts **32** each include the ventilation part **30** in the wall surface that spaces the accommodation part **32** and the through hole apart from each other. The ventilation part **30** may be a notch or may be a hole provided so as to pass through the wall surface that spaces the through hole apart.

FIG. **5** illustrates a place on the periphery of the ventilation part **30** in the first embodiment in an enlarged manner. In the example in FIG. **5**(*a*), the ventilation part **30** is a notch formed in an upper edge of the wall surface that spaces the accommodation part **32** and the through hole apart from each other. When air is pushed out in the airflow direction F**1** (see FIG. **2**) by the rotation of the fan, the atmospheric pressure on the fan side becomes higher than the atmospheric pressure in the accommodation part **32**.

Therefore, the air flows into the accommodation part **32** from the fan side via the ventilation part **30**. The accommodation part **32** has a hole in a wall surface, which is on the rear side with respect to the airflow direction F**1** and does not face the fan (not shown). When the air flowing in from the fan side flows out from this hole, particles generated when the medical agent arranged in the accommodation part **32** is vaporized are discharged with the air.

The particles discharged with the air are discharged to the outside of the air-conditioned garment **100** via grooves formed in the power supply unit **3** and the blower unit **2**. For example, by arranging fiber and the like moistened with insect repellent in the accommodation part **32**, particles generated by the vaporization of the insect repellent when the fan rotates is discharged to the outside of the air-conditioned garment **100**. As a result, the particles float around the air-conditioned garment **100**, and hence insects can be kept away from places around the wearer.

It is mote preferred that the ventilation part **30** be gradually inclined to the front side with respect, to the airflow direction F**1** from the fan side to the accommodation parts **32** side. This is because the air pushed out toward the airflow direction F**1** flows into the ventilation part **30** from the fan side in a further easier manner.

In the example illustrated in FIG. **5**(*b*), the ventilation part **30** is a hole provided so as to pass through the wall surface that spaces the accommodation part **32** and the through hole apart from each other. In the illustrated example, the ventilation part **30** is formed on the rear side with respect to the airflow direction F**1** (see FIG. **2**). By the rotation of the fan, the atmospheric pressure of the air on the fan side becomes higher than that of the air in the accommodation part **32**.

In this case, the air on the fan side of which atmospheric pressure is high flows into the accommodation part **32** via the ventilation part **30**. Accordingly, the air in the accommodation part **32** of which atmospheric pressure is low is pushed out to the far side from the ventilation part **30**. As a result, particles generated by the vaporization of the medical agent in the accommodation part **32** are discharged to the fan side via the ventilation part **30**. Then, those particles are diffused toward the airflow direction F**1** caused by the rotation of the fan.

For example, when fiber moistened with deodorant and the like is arranged in the accommodation part **32**, particles of the deodorant and the like that have vaporized are discharged to the fan side via the ventilation part **30** and are diffused into the air-conditioned garment toward the airflow direction F**1**.

In this case, it is more preferred that the hole forming the ventilation part **30** be gradually inclined to the front side with respect to the airflow direction F**1** from the accommodation part **32** to the fan side. As a result, the air in the accommodation part **32** of which atmospheric pressure is low is easily discharged to the fan side through the ventilation part **30**, and hence the particles of the medical agent are efficiently discharged to the fan side.

FIG. **6** is a side view illustrating one example of the blower unit **2** in the first embodiment. The blower unit **2** includes the first housing **6** that houses the fan and the motor. The first housing **6** includes the first contact parts **14** through which the power supplied by the power supply unit **3** can be supplied, and the flange **20** (first flange) formed on the rear surface side.

The first housing **6** houses the fan, a motor storage part **40** that stores the motor therein, and the rotation shaft **42** provided in a standing manner from the motor storage part **40** toward the airflow direction F**1**. An AC motor may be used for the motor, or the motor may be a DC motor. The first housing **6** has a dome shape in a side view and forms a steeple toward the airflow direction F**1** generated by the rotation of the fan.

The first contact parts **14** are formed on a side wall of the first housing **6** in a protruding manner. The first contact parts **14** are disposed in positions corresponding to the second contact parts **16** in the second housing **8**. The first contact parts **14** may be biased toward the outer side by springs and the like.

The flange **20** (first flange) extends from an end part of the first housing **6** on the rear side with respect to the airflow direction F**1** to the outer side in a continuous manner. The flange **20** may be integrally formed with the first housing **6** or may be bonded to the first housing **6** in a separable manner.

FIG. **7** is a side view illustrating one example of the configuration of the blower **1** for the air-conditioned garment in the first embodiment. When the blower **1** for the air-conditioned garment in this embodiment is installed on the air-conditioned garment **100**, the blower unit **2** is inserted in the mounting hole from the outer surface side of the air-conditioned garment **300** toward the airflow direction F**1**. The flange **20** (first flange) is formed in a size that abuts cloth on the peripheral edge of the mounting hole. When the flange **20** (first flange) abuts the cloth on the peripheral edge of the mounting hole, the entry of the blower unit **2** into the air-conditioned garment **100** stops.

In a state in which the flange **20** (first flange) is abutting the cloth on the peripheral edge of the mounting hole, the blower unit **2** is inserted into the through hole in the power supply unit **3** from the inner surface side of the air-conditioned garment **100**. The through hole in the second housing **3** has a shape corresponding to a cross-sectional shape orthogonally intersecting the rotation shaft **42** of the first housing **6**. Therefore, the blower unit **2** is inserted in the through hole in the power supply unit **3**, and the blower unit **2** and the power supply unit **3** are satisfactorily engaged with each other.

When the blower unit **2** and the power supply unit **3** are engaged with each other, the first contact parts **14** and the second contact parts **16** abut each other. As a result, power is supplied to the blower unit **2** from the power supply unit **3**. The power is supplied to the blower unit **2** from the power supply unit **3** without passing through a cable, and hence there is no fear of damage to the cable regardless of the movement of the wearer of the air-conditioned garment **100**, and the power can be stably supplied. The first contact parts **14** and the second contact parts **16** press each other, and hence the engagement between the blower unit **2** and the power supply unit **3** becomes stronger.

The second housing **8** includes a receiving part **22** (first receiving part). When the blower **1** for the air-conditioned garment is installed on the air-conditioned garment **100**, the receiving part **22** (first receiving part) and the flange **20** (first flange) sandwich the cloth on the peripheral edge of the mounting hole therebetween. As a result, the blower **3** for the air-conditioned garment can be satisfactorily installed without falling off from the air-conditioned garment **100**.

In this embodiment, in the blower unit **2**, an operation unit that controls OK/OFF of the motor is disposed on the rear side of the first housing **6** with respect to the airflow direction F**1**. When the blower **1** for the air-conditioned garment is installed on the air-conditioned garment **100**, the operation unit is exposed to the outer surface side. Therefore, the switching operation of ON/OFF of the blower **1** for the air-conditioned garment can be easily performed.

Second Embodiment

FIG. **8** is a side view illustrating the blower **1** for an air-conditioned garment in a second embodiment of the present invention. In the second embodiment, the blower unit **2** includes the first housing **6** that houses a fan. The first housing **6** includes a motor storage part **50** near a steeple part of a dome shape. In the first housing **6**, the motor storage part **50** is connected to one end side of the rotation shaft **42**.

The first contact part **14** is included on an opposite-side end part of the rotation shaft **42**. In the second embodiment, the first contact part **14** is a pinhole including electrically-conductive metal. The first contact part **14** is formed on the rear side with respect to the airflow direction F**1**. The first contact part **14** is formed in a position corresponding to the second contact part **16** formed on the second housing **8**.

The power supply unit **3** includes the second housing **8**. In the second embodiment, the second housing **8** includes the holding part **12** that accommodates the battery **10** at a place near a central part on the front surface side and includes the second contact part **16**. The second contact part **16** is formed in a position corresponding to the first contact part **14** at a place near a central part on the front surface side. The holding part **12** is formed so as to protrude in the front direction at a place near the center on the front surface side.

In the second embodiment, the second housing **3** includes a flange **60** (second flange) extending from the center of a rear part. The first housing **6** includes a receiving part **62** (second receiving part) that can abut the flange **60**.

A method of installing the blower **1** for the air-conditioned garment in the second embodiment on the air-conditioned garment **100** is described. The blower unit **2** is arranged on the inner surface side across a mounting hole in the air-conditioned garment **100**, and the power supply unit **3** is arranged on the outer surface side across the mounting hole in the air-conditioned garment **100**. The holding part **12** and the second contact part **16** formed near the central part of the second housing **3** are inserted in the mounting hole, and the second contact part **16** and the first contact part **14** arranged on the inner surface side of the air-conditioned garment **100** are caused to abut each other.

A back surface of the first housing **6** has a shape that is engageable with a front surface of the second housing **8** including the holding part **12**. Therefore, the front surface of the second housing **8** is engaged with the back surface of the first housing **6**, and the first contact part **14** and the second contact part **16** abut each other. Power can be supplied through the first contact part **14** and the second contact part **16** by the abutment of the first contact part **14** and the second contact part **16** without passing through a cable. As a result, power can be supplied from the power supply unit **3** to the blower unit **2** without passing through a cable, and hence damage to the cable does not occur regardless of the movement of the wearer of the air-conditioned garment **100**, and the power can be stably supplied.

The flange **60** (second flange) has a larger size than the mounting hole. Therefore, the flange **60** (second flange) abuts cloth on the peripheral edge of the mounting hole. The receiving part **62** (second receiving part) and the flange **60** (second flange) sandwich the cloth on the peripheral edge of the mounting hole therebetween. Therefore, by engaging the blower unit **2** and the power supply unit **3** with each other across the mounting hole, the blower **1** for the air-conditioned garment can be installed on the air-conditioned garment **100** in a simple manner, and the falling off from the air-conditioned garment **100** can be prevented.

FIG. **9** is a rear view of the power supply unit **3** in the second embodiment. The second housing **8** includes the holding part **12** at a place near the central part and a plurality of spokes **70** radially extending from the center. The flange

60 (second flange) extends outside of outer-side end parts of the spokes 70 in a continuous manner.

Ventilatable gaps are formed between the spokes 70, and hence air is sucked in the direction of the fan through those gaps in accordance with the rotation of the fan. The flange 60 (second flange) is formed to be able to abut the receiving part 62 (second receiving part) and has a predetermined width. The diameter of a back surface of the second housing 8 in the second embodiment is larger than the diameter of the mounting hole in the air-conditioned garment 100.

Therefore, the flange 60 (second flange) abuts the cloth on the peripheral edge of the mounting hole when being installed on the air-conditioned garment 100. The receiving part 62 (second receiving part) of the blower unit 2 is disposed in a position that can abut the flange 60 (second flange) from the inner surface side across the mounting hole, and hence the cloth on the peripheral edge of the mounting hole is sandwiched between the flange 60 (second flange) and the receiving part 62 (second receiving part).

In the second embodiment, the second housing 8 may include a light-emitting part on the rear surface side with respect to the airflow direction F1. As one example, by arranging an LED lamp in a predetermined position on the rear surface side of the second housing 9, the light-emitting part emits light by power supplied from the battery 10. Alternatively, by applying fluorescent paint or phosphorescent paint, in a predetermined position on the rear surface side of the second housing 8, the light-emitting part may reflect or radiate light instead.

Third Embodiment

FIG. 10 is a side view of the blower 1 for an air-conditioned garment in a third embodiment of the present, invention. The blower 1 for the air-conditioned garment in the third embodiment includes the blower unit 2, the power supply unit 3 that supplies power to the blower unit 2, and a fastening ring 74 that sandwiches cloth on the peripheral edge of a mounting hole in the air-conditioned garment 100 with the flange 20 (first flange) therebetween.

The blower unit 2 includes the first housing 6 that houses a fan. The first housing 6 includes the first contact parts 14 in predetermined positions on a side surface. The first contact, parts 14 in the third embodiment, are made of electrically-conductive metal to each have a nook-like shape.

The first housing 6 may include an accommodation part (not shown) that accommodates an object made of fiber such as cloth moistened with medical agents such as deodorant and insect repellent at a place near a steeple part of a dome shape. The accommodation part includes a ventilation part on the outer side. By disposing the accommodation part on the front side of the fan with respect to the airflow direction F1, the particles of the medical agent can be satisfactorily diffused by the airflow generated by the rotation of the fan.

The power supply unit 3 includes the second housing 9 that houses the battery 10. The second housing 8 includes the second contact parts 16 engageable with the first contact parts 14 of the first housing 6. The second contact parts 16 each have a hook-like shape protruding outward from the second housing 8 and are configured to be engaged with the first contact parts 14. The second housing 8 is engaged with the first housing 6 when the second contact parts 16 are engaged with the first contact parts 14.

The fastening ring 74 has a ring-like shape having a hole in the central part. In a state in which the first housing 6 and the second housing 8 are engaged with each other, the first housing 6 can be inserted into the hole of the fastening ring 74 from the front side. The hole of the fastening ring 74 corresponds to a cross-sectional shape orthogonally intersecting with the rotation shaft 42 of the first housing 6.

When the first housing 6 is inserted into the fastening ring 74, the flange 20 (first flange) abuts the fastening ring 74. When the blower 1 for the air-conditioned garment in the third embodiment is installed on the air-conditioned garment 100, the first housing 6 is inserted into the mounting hole from the outer surface side of the air-conditioned garment 100. The flange 20 of the first housing 6 is formed to have a larger diameter than the mounting hole, and hence abuts the cloth on the peripheral edge of the mounting hole.

Insertion of the first housing 6 into the hole of the fastening ring 74 from the inner surface side of the air-conditioned garment 100 can allow the cloth on the peripheral edge of the mounting hole to be sandwiched between the fastening ring 74 and the flange 20 (first flange). As a result, the blower 1 for the air-conditioned garment can be installed on the air-conditioned garment 100, and the falling off from the air-conditioned garment 100 can be prevented.

Fourth Embodiment

FIG. 11 illustrates the configuration of the blower 1 for an air-conditioned garment in a fourth embodiment of the present invention. In the fourth embodiment, the blower 1 for the air-conditioned garment includes a main body part 90 including a motor that drives a fan and the batteries 10 (power supply units), and a rear cover 94 engageable with the main body part 90.

The main body part 90 includes the motor storage part 40 that stores the motor therein, the holding parts 12 that house the batteries 10, and the fan disposed on the periphery of the rotation shaft 42. In this embodiment, they are stored in one housing. The motor storage part 40 and the holding parts 12 are disposed in positions that do not block the rotation of the fan. The batteries 10 and the motor are not connected to each other by a cable and the like in the housing. Therefore, with only the main body part 90, the power is not supplied to the motor, and hence the motor is not driver.

The main body part 90 includes a first locking part 75 that is configured to be engaged with a second locking part 76 formed on the rear cover 94. The first locking part 75 is a thread groove formed in an inner surface of the housing, for example. The first locking part 75 may be formed in an outer surface of the housing instead.

The rear cover 94 is a member that is engaged with the rear surface side of the main body part 90 with respect to the airflow direction F1, and protects components such as the motor disposed in the housing of the main body part 90 by occluding the rear surface side of the main body part 90. The rear cover 94 includes the second locking part 76 in a position corresponding to the first locking part 75 of the main body part 90. The second locking part 76 is a thread groove having a shape corresponding to the first locking part 75.

When the main body part 90 and the rear cover 94 are engaged with each other, cloth on the peripheral edge of a mounting hole formed in the air-conditioned garment 100 is sandwiched in a section at which the main body part 90 and the rear cover 94 abut each other. As a result, when the blower 1 for the air-conditioned garment in this embodiment is installed on the air-conditioned garment 100, the falling off from the air-conditioned garment 100 is suppressed.

The main body part 90 and the rear cover 94 may have shapes that fit together instead. In this case, the main body

part **90** does not necessarily need to include the first locking part **75**, and the rear cover **94** does not necessarily need to include the second locking part **76**.

FIG. **12** is a front view of the main body part **90** in the fourth embodiment. As described above, the main body part **90** includes the motor storage part **40** and the holding parts **12** in the housing. The main body part **90** includes the first locking part **75** on the inner periphery of the housing.

The main body part **90** includes third contact parts **78** connected to the holding parts **12** that house the batteries **10** by cables. The third contact parts **78** are made of metal and the like through which power can be supplied and are disposed in predetermined positions in the first locking part **75**.

The main body part **90** includes fourth contact parts **79** connected to the motor stored in the motor storage part **40** by cables. The fourth contact parts **79** are made of metal and the like through which power can be supplied. The fourth contact parts **79** are disposed in positions that do not come into contact with the third contact parts **78** in the first locking part **75**.

FIG. **13** is a perspective view of the rear cover **94** in the fourth embodiment. The rear cover **94** is engaged with the main body part **90** from the rear surface side. The rear cover **94** includes the second locking part **76** composed of a thread groove, and the second locking part **76** is engageable with the first locking part **75**.

The rear cover **94** includes electrically-conductive parts **77** that abut the third contact parts **78** and the fourth contact parts **79**. The electrically-conductive parts **77** are disposed in positions corresponding to the third contact parts **78** and the fourth contact parts **79**. The electrically-conductive parts **77** abut the third contact parts **78** and abut the fourth contact parts **79** when the main body part **90** and the rear cover **94** are engaged with each other. The electrically-conductive parts **77** are made of metal and the like through which power can be supplied.

The electrically-conductive parts **77** are disposed in the second locking part **76**. The electrically-conductive parts **77** are disposed in positions corresponding to the third contact parts **78** and the fourth contact parts **79** in the second locking part **76**. In other words, the electrically-conductive parts **77** abut the third contact parts **78** and the fourth contact parts **79** when the first locking part **75** and the second locking part **76** are engaged with each other.

When the first locking part **75** and the second locking part **76** are engaged with each other when the electrically-conductive parts **77** are disposed in the second locking part **76** and the third contact parts **79** and the fourth contact parts **79** are disposed in the first locking part **75**, the electrically-conductive parts **77** abut the third contact parts **73** and the fourth contact parts **79**. As a result, even when positioning for causing the electrically-conductive parts **77** to abut the third contact parts **78** and the fourth contact parts **79** is not performed, it is sufficient when the first locking part **75** and the second locking part **76** are engaged with each other, and the efficiency of the operation is increased.

When the electrically-conductive parts **77** abut the third contact parts **78** and the fourth contact parts **79**, the electrically-conductive parts **77** relay power between the third contact parts **78** and the fourth contact parts **79**. In other words, power is transmitted from the batteries **10** to the third contact parts **78**, and the power from the third contact parts **78** reaches the fourth contact, parts **79** by the relay through the electrically-conductive parts **77**. Then, the power is supplied to the motor stored in the motor storage part **40** from the fourth contact parts **79** via the cables.

Engagement of the main body part **90** and the rear cover **94** allows the power to be supplied to the motor so as to activate the motor. By separating the rear cover **94** and the main body part **90** from each other when the blower **1** for the air-conditioned garment in this embodiment is not used, the power consumption of the batteries **10** can be suppressed.

In a state in which the main body part **90** and the rear cover **94** are not engaged with each other, the rear surface side of the main body part **90** is opened. The power is not supplied to the motor in a state in which the main body part **90** is not engaged with the rear cover **94**. Therefore, even when an infant inserts a finger into the inside from the opening in the main body part **90**, damage to the finger due to the rotation of the fan does not occur and security is increased.

The third contact parts **78** and the fourth contact parts **79** may be disposed outside of the first locking part **75** and the electrically-conductive parts **77** may be disposed outside of the second locking part **76**. The electrically-conductive parts **77** abut the third contact parts **78** and the fourth contact parts **79** when the main body part **90** and the rear cover **94** are engaged with each other.

Air-Conditioned Garment **100**

FIG. **14** illustrates one example of the air-conditioned garment **100** on which the blowers **1** for the air-conditioned garment are mounted. FIG. **14**(*a*) is a rear view of the air-conditioned garment **100** in a state in which the blowers **1** for the air-conditioned garment are installed. The air-conditioned garment **100** includes mounting holes on a lower part on the rear surface side. In the illustrated example, a case where a plurality of mounting holes are included is shown, but the number of the mounting holes may be one.

When the blowers **1** for the air-conditioned garment are driven, air is sucked in from the outer side of the air-conditioned garment **100** and is discharged to the inner side of the air-conditioned garment **100**. As a result, the evaporation of sweat of the wearer wearing the air-conditioned garment **100** is facilitated, and the rise in the body temperature of the wearer is suppressed.

The air-conditioned garment **100** includes narrow parts **104** (ventilation adjustment parts) near borders between shoulder parts and sleeve parts. The narrow parts **104** (ventilation adjustment parts) may be formed by sewing elastic bodies such as rubber in the sleeve parts. Alternatively, adjustment strings having the inner periphery widths may be wound around the sleeve parts. The narrow parts **104** (ventilation adjustment parts) each have a function of adjusting the air quantity that flows into the sleeve parts from a torso part of the air-conditioned garment **100**.

When the inner periphery widths of the sleeve parts are narrowed by narrowing the narrow parts **104** (ventilation adjustment parts), the air quantity that flows into the sleeve parts from the torso part decreases. When the blowers **1** for the air-conditioned garment are driven, the air flows into the air-conditioned garment **100** through the blowers **1** for the air-conditioned garment, and hence the volume of the air in the air-conditioned garment **100** increases, and the air-conditioned garment **100** is inflated. When the narrow parts **104** (ventilation adjustment parts) are narrowed, the inner periphery widths of the sleeve parts become narrower. Therefore, the quantity of the air that flows into the sleeve parts can be suppressed, and hence the inflation of the sleeve parts caused by air is suppressed. As a result, the movement

of the arms of the wearer can be prevented from being hampered by the inflated sleeve parts.

FIG. **14**(*b*) illustrates the place in which the blower **1** for the air-conditioned garment is installed in an enlarged manner. In the illustrated example, the flange **20** (first flange) of the first housing **6** is exposed to the outer side of the air-conditioned garment **100**, and the second housing **8** is hidden on the inner side of the air-conditioned garment **100**.

The cloth on the peripheral edge of the mounting hole is sandwiched between the flange **20** (first flange) and the receiving part **22** (first receiving part), and hence the blower **1** for the air-conditioned garment is satisfactorily installed. An operation unit that controls the driving of the motor may be mounted on the rear surface side of the first housing **6**. By including the operation unit in a place that is exposed from the air-conditioned garment **100**, the wearer can easily perform the operation.

Modification

The embodiments relating to the present invention have been described above, but the present invention is not limited to the configurations described in the above-mentioned embodiments and can be applied to various modifications.

For example, in the above-mentioned embodiments, a case where the accommodation part **32** accommodates cloth and the like moistened with a medical agent has been described. However, the present invention is not limited thereto, and the first housing **6** may include a medical agent arranging part in which cloth and the like moistened with a medical agent can be arranged. As one example, the medical agent arranging part is included on the front surface side of the first housing **6** on the front side with respect to the airflow direction F**1** and is made of a flat-plate-like resin on which cloth can stick. The medical agent arranging part may have a ventilation hole.

For example, in the above-mentioned embodiments, a case where the blower unit **2** and the power supply unit **3** are engaged with each other by fitting the first housing **6** and the second housing **8** together has been described. However, the present invention is not limited thereto, and a thread member, for example, may be used in order to engage the blower unit **2** and the power supply unit **3** with each other.

Fifth Embodiment

FIG. **15** is a front view illustrating a blower **200** for an air-conditioned garment in one embodiment of the present invention. The blower **200** for the air-conditioned garment is used by being installed on the air-conditioned garment **100**. The blower **200** for the air-conditioned garment is installed on the air-conditioned garment **100** by being inserted in a mounting hole formed in the air-conditioned garment **100**. In a fifth embodiment, the blower **200** for the air-conditioned garment includes an axial blower and a centrifugal blower. One example in which the blower **200** for the air-conditioned garment is an axial blower is described below.

The blower **200** for the air-conditioned garment includes a main body part **202** including a fan **204** and a motor **206** that drives the fan **204**. The blower **200** for the air-conditioned garment includes a rear frame **203** installed from the rear surface side of the main body part **202**. As described below, in the blower **200** for the air-conditioned garment, the air-conditioned garment **100** is sandwiched between the main body part **202** and the rear frame **203**.

The main body part **202** includes the fan **204** and batteries **208** that supply power to the motor **206** that drives the fan **204**. The batteries **208** are composed of storage batteries, for example. One battery **208** may be disposed or a plurality of the batteries **208** may be disposed in the main body part **202**.

The batteries **208** are disposed on the outer side of the outer diameter of the fan **204** in a front view. The batteries **208** are disposed on the outer side with respect to the outer diameter of the fan **204** in the direction of a rotation shaft **207** of the fan **204**. In other words, the batteries **208** are disposed on the outer side of the airflow generated when the fan **204** rotates. As a result, gas can be efficiently sent into the air-conditioned garment without blocking the airflow generated by the rotation of the fan **204**.

The batteries **208** may be disposed so as to be unevenly distributed on the outer side with respect to the outer diameter of the fan **204** in the direction of the rotation shaft **207**. The batteries **208** may be disposed such that the longitudinal direction thereof is close to the outer periphery of the fan **204**. By disposing the batteries **208** on the outer side with respect to the outer diameter of the fan **204** in an unevenly distributed manner, the center of gravity that is separated from the rotation shaft **207** by a predetermined distance is placed on the lower side and the blower **200** for the air-conditioned garment becomes stable when the blower **200** for the air-conditioned garment is installed on the air-conditioned garment **100**.

When the fan **204** is rotated, a case where the blower **200** for the air-conditioned garment itself rotates in a state of being installed on the air-conditioned garment **100** in accordance with the rotation of the fan **204** can be satisfactorily suppressed.

A fan cover **212** is disposed on the front side of the fan **204**. The fan cover **212** is disposed on the front side with respect to the fan **204**. In the example in FIG. **15**, the fan cover **212** is formed to be ventilatable by a frame radially extending from the center.

On the front side of the fan **204**, an exhaust port **210** is formed. The exhaust port **210** discharges gas pushed out to the front side by the rotation of the fan **204**.

FIG. **16** illustrates one example of the configuration of the blower **200** for the air-conditioned garment in this embodiment seen from a side surface.

FIG. **16**(*a*) is one example of a side view of the blower **200** for the air-conditioned garment in this embodiment. The main body part **202** has a through hole **220** at a place substantially near the center. The fan **204** and the motor **206** are arranged in the through hole **220**. The fan cover **212** is disposed on the front side of the through hole **220**. The fan cover **212** is detachably engaged with the main body part **202**.

The main body part **202** includes an operation switch **214**. The operation switch **214** inputs a signal to a control unit **222** that controls the driving of the motor **206**. For example, the operation switch **214** includes a switch for switching ON/OFF of the motor **206**, and a switch for switching the rotation speed of the motor **206**.

The operation switch **214** and the control unit **222** are connected to each other by a cable and the like in the main body part **202**. In other words, the cable is hidden without being exposed to the outside of the main body part **202**, and hence damage to the cable due to the movement of the wearer of the air-conditioned garment **100** can be satisfactorily avoided.

The rear frame **203** is detachably engaged with the rear surface side of the main body part **202**. The rear frame **203** includes a suction port **221** that is substantially the same size as the through hole **220**.

FIG. **16**(*b*) is one example of a side cross-sectional view of the blower **200** for the air-conditioned garment in this embodiment.

When the rear frame **203** is engaged with the main body part **202**, the suction port **221** is included on the rear side of the through hole **220**. An inner peripheral wall of the rear frame **203** is formed so as to gradually expand toward the rear side. The suction port **221** has an inner diameter that gradually expands toward the rear side in the flow direction of the gas. As a result, when the fan **204** rotates, the resistance when the gas is sucked in can be reduced.

The inner diameter of the inner peripheral wall of the rear frame **203** may be substantially the same without gradually expanding instead.

The fan cover **212** is engaged with the main body part **202** at an inner peripheral wall of the through hole **220**. The fan cover **212** further includes an engaging part **212***a*. The engaging part **212***a* is engaged with an inner-peripheral side surface of the through hole **220**. The fan **204** is integrally formed with the rotation shaft **207**. A length (n1) of the fan **204** from the rotation shaft **207** is shorter than a length (n2) from the rotation shaft **207** to an inner peripheral wall of the engaging part **212***a*. Because n1<n2 is satisfied, a case where the fan **204** comes into contact with the engaging part **212***a* when the fan **204** rotates can be avoided.

The inner peripheral wall of the engaging part **212***a* and the part of the inner peripheral wall of the through hole **220** that is not engaged with the engaging part **212***a* may be preferably formed to be substantially flush with each other. The part of the inner peripheral wall of the through hole **220** that is engaged with the engaging part **212***a* has a larger inner diameter than the other parts of the inner peripheral wall of the through hole **220** and expands to the outer side. When the fan cover **212** is engaged with the main body part **202**, the engaging part **212***a* and the part of the inner peripheral wall of the through hole **220** that is expanded to the outer side are engaged with each other. In a state in which the engaging part **212***a* and the part of the inner peripheral wall of the through hole **220** that is expanded to the outer side are engaged with each other, a level difference between the inner peripheral wall of the engaging part **212***a* and the other parts of the inner peripheral wall of the through hole **220** is minimized. As a result, the operation efficiency for disposing the fan **204** in the through hole **220** in a state in which the fan cover **212** is engaged with the main body part **202** can be increased.

FIG. **17** illustrates one example of the fan cover **212** in this embodiment. FIG. **17**(*a*) is a front view of the fan cover **212**. The fan cover **212** is composed of a frame made of resin and the like and radially extending from the center. The through hole **220** is occluded from the front side. In the example in FIG. **17**(*a*), the fan cover **212** has a circular shape in a front view. The length from the center to an outer edge is longer than the inner diameter of the through hole **220**.

FIG. **17**(*b*) is a side view of the fan cover **212**. As described above, the fan cover **212** includes the engaging part **212***a* that is configured to be engaged with the inner peripheral wall of the through hole **220**. The fan cover **212** includes the exhaust port **210** on the front, side in the flow direction of the gas in a manner that is continuous with the engaging part **212***a*.

The inner periphery of the exhaust port **210** is formed so as to expand to the outer side from the inner peripheral wall of the engaging part **212***a*. The exhaust port **210** is formed on the front side in the flow direction of the gas so as to be continuous from the engaging part **212***a*. An inner peripheral wall of the exhaust port **210** is formed so as to expand to the outer side. As a result, the resistance when the gas is discharged can be reduced.

FIG. **13** illustrates one example of the configuration of the blower **200** for the air-conditioned garment in this embodiment. FIG. **13**(*a*) is a front view of the blower **200** for the air-conditioned garment. Three batteries **208** are disposed on the outer side with respect to the cuter diameter of the fan **204** in the main body part **202**. The batteries **208** are connected to the motor **206** by cables and the like in the main body part **202** such that power can be supplied therethrough. The cables that connect the motor **206** and the batteries **206** to each other are hidden in the main body part **202**.

FIG. **18**(*b*) is a cross-sectional view of the blower **200** for the air-conditioned garment taken along line A-A'. The main body part **202** includes a first receiving part **224***a* that is engaged with the engaging part **212***a* of the fan cover **212**. The first receiving part **224***a* expands to the outer side with respect to the inner periphery of the through hole **220**. As a result, when the engaging part **212***a* and the first receiving part **224***a* are engaged with each other, the diameter of the inner peripheral wall of the engaging part **212***a* becomes substantially the same as that of the inner periphery of the through hole **220**.

The main body part **202** includes a second receiving part **224***b* that is engaged with the rear frame **203**. The second receiving part **224***b* is included on the outer side of the through hole **220** on the rear surface side of the main body part **202**. The second receiving part **224***b* is formed so as to be drawn in from a rear-surface-side end surface on the outer side of the through hole **220**. As a result, when the fan cover **212** is engaged with the main body part **202**, the inner peripheral wall of the through hole **220** and the inner peripheral wall of the engaging part **212***a* become substantially flush with each other, and hence the fan **204** can be satisfactorily disposed in the through hole **220**.

FIG. **19** illustrates one example of the configuration of the rear frame **203** in this embodiment. FIG. **19**(*a*) is a front view of the rear frame **203**. The rear frame **203** has a substantially circular shape. The rear frame **203** includes the suction port **221** having a substantially circular shape on the center side. The suction port **221** is formed to have substantially the same inner diameter as the through hole **220**.

FIG. **19**(*b*) is a side view of the rear frame **203**. The suction port **221** is formed such that the inner diameter gradually expands toward the rear side with respect to the flow direction of the gas. An inner-peripheral-side end part forming the suction port **221** is formed so as to gradually expand to the outer side toward the rear side. As a result, the resistance when the gas is sucked in can be reduced.

FIG. **20** is a block diagram illustrating one example of the functional configuration of the blower **200** for the air-conditioned garment in this embodiment. The blower **200** for the air-conditioned garment includes the control unit **222** that controls the driving of the motor **206**. The operation switch **214** inputs a signal to the control unit **222** in accordance with the operation of a user. The control unit **222** controls the motor **206** in accordance with the signal input from the operation switch **214**.

The control unit **222** further includes a driving control unit **222***a* that performs the switching control of ON/OFF of the motor **206**, and an operation control unit **222***b* that performs the switching control of the rotation speed of the motor **206**.

When a signal for driving the motor **206** is input from the operation switch **214**, the driving control unit **222***a* starts the driving of the motor **206**. When a signal for stopping the driving of the motor **206** is input from the operation switch **214**, the driving control unit **222***a* stops the driving of the motor **206**.

The operation control unit **222***b* is a processing unit that controls the switching of the rotation speed of the motor **206** in a state in which the motor **206** is being driven. The operation control unit **222***b* sets the rotation speed of the motor **206** to one of preset three stages as one example. By switching the rotation speed of the motor **206**, the quantity of gas discharged into the air-conditioned garment **100** can be adjusted.

The control unit **222** may be built in the operation switch **214** or may be built in the motor **206** instead. The operation switch **214**, the control unit **222**, and the motor **206** are all disposed in the main body part **202**. Therefore, cables that connect the above to each other can be hidden in the main body part **202**, and hence a case where the cables become worn out in accordance with the movement of the body of the user wearing the air-conditioned garment **100** can be suppressed.

FIG. **21** illustrates one example of the air-conditioned garment **100** on which the blowers **200** for the air-conditioned garment in this embodiment are mounted. FIG. **21**(*a*) is a rear view of the air-conditioned garment **100** in a state in which the blowers **200** for the air-conditioned garment are installed. The air-conditioned garment **100** includes mounting holes on a lower part on the rear surface side. In the illustrated example, a case where a plurality of mounting holes are included is shown, but the number of the mounting holes may be one.

When the motors **206** of the blowers **200** for the air-conditioned garment are driven, air is sucked in from the outer side of the air-conditioned garment **100** and is discharged to the inner side of the air-conditioned garment **100**. As a result, the evaporation of sweat of the wearer wearing the air-conditioned garment **100** is facilitated, and the rise in the body temperature of the wearer is suppressed.

The air-conditioned garment **100** includes narrow parts **104** (ventilation adjustment parts) near borders between shoulder parts and sleeve parts. The narrow parts **104** (ventilation adjustment parts) may be formed by sewing elastic bodies such as rubber in the sleeve parts. Alternatively, adjustment strings having the inner periphery widths may be wound around the sleeve parts. The narrow parts **104** (ventilation adjustment parts) each have a function of adjusting the air quantity that flows into the sleeve parts from a torso part of the air-conditioned garment **100**.

When the inner periphery widths of the sleeve parts are narrowed by narrowing the narrow parts **104** (ventilation adjustment parts), the air quantity that flows into the sleeve parts from the torso part decreases. When the blowers **200** for the air-conditioned garment are driven, the air in the air-conditioned garment **100** flows in through the blowers **200** for the air-conditioned garment, and hence the volume of the air in the air-conditioned garment **100** increases, and the air-conditioned garment **100** is inflated. When the narrow parts **104** (ventilation adjustment parts) are narrowed, the inner periphery widths of the sleeve parts become narrower. Therefore, the quantity of the air that flows into the sleeve parts can be suppressed, and hence the inflation of the sleeve parts caused by air is suppressed. As a result, the movement of the arms of the wearer can be prevented from being hampered by the inflated sleeve parts.

FIG. **21**(*b*) illustrates one example of an aspect of the mounting of the blower **200** for the air-conditioned garment. The main body part **202** and the rear frame **203** are formed so as to sandwich the air-conditioned garment **100** therebetween. The rear frame **203** has an end part that expands to the outer side on the rear side with respect to the flow direction of the gas.

The end part of the rear frame **203** expanding to the outer side and the main body part **202** sandwich an end part of the mounting hole in the air-conditioned garment **100** when the rear frame **203** is engaged with the main body part **202**. In other words, when the main body part **202** is arranged on the inner side of the air-conditioned garment **100**, the rear frame **203** is arranged on the outer side of the air-conditioned garment **100**, and the rear frame **203** is engaged with the main body part **202**, the main body part **202** and the rear frame **203** are engaged with each other across the mounting hole in the air-conditioned garment **100**. As a result, the blower **200** for the air-conditioned garment is installed on the air-conditioned garment **100**.

FIG. **22** illustrates one example of the blower **200** for the air-conditioned garment that is different from the configuration of the blower **200** for the air-conditioned garment described above. The main body part **202** has a dome shape in cross section and includes the fan **204**, the motor **206**, and the batteries **206**. In the main body part **202**, the front side with respect to the airflow direction F**1** has a steeple shape.

The batteries **206** are disposed on the rear side with respect to the fan **204** with respect to the flow direction of the gas. Alternatively, the batteries **208** may be disposed on the outer side with respect to the outer diameter of the fan **204** from the rotation shaft **207** instead.

The rear frame **203** is configured to be engaged with the rear surface side of the main body part **202**. When the rear frame **203** is engaged with the main body part **202**, the rear frame **203** and the main body part **202** are engaged with each other across the mounting hole in the air-conditioned garment **100**. The main body part **202** and the rear frame **203** are engaged with each other while sandwiching the cloth on the peripheral edge of the mounting hole therebetween. As a result, the blower **200** for the air-conditioned garment is installed on the air-conditioned garment **100**.

FIG. **23** illustrates one example of the configuration of the rear frame **203**. In the illustrated example, the rear frame **203** includes a thread part that is engaged with the main body part **202**. The rear frame **203** includes a sandwiching part **230** for sandwiching a peripheral edge part of the mounting hole in the air-conditioned garment **100**.

The sandwiching part **230** and a corresponding part of the main body part **202** sandwich the peripheral edge part of the mounting hole in the air-conditioned garment **100** therebetween when the main body part **202** and the rear frame **203** are engaged with each other.

The present invention includes the invention described below.

A fan unit accommodating housing including: a main body part housing including: the through hole **220** that can house a fan unit including: a fan; and a motor; and a housing part that can house the battery **208** on a periphery of the through hole **220**; the fan cover **212** detachably engaged with the main body part housing; and the rear frame **203** engaged with the main body part housing in a separable manner. In the fan unit accommodating housing, the fan cover **212** further includes: the engaging part **212***a* that is engaged with an inner peripheral side surface of the through hole **220**; and the exhaust port **230** formed on a front side with respect to a flow direction of gas so as to be continuous

with the engaging part **212***a*, and an inner periphery of the exhaust port **210** expands from an inner peripheral wall of the engaging part **212***a* to an outer side.

In the abovementioned fan unit accommodating housing, a length from the rotation shaft **207** to the inner peripheral wall of the engaging part **212***a* may be longer than an outer diameter of the fan **204** when the engaging part **212***a* is engaged with the inner peripheral side surface of the through hole **220**.

In the above-mentioned fan unit accommodating housing, the rear frame **203** may further include the suction port **221** that sucks in gas, and the suction port **221** may have an inner diameter that gradually expands toward the rear side with respect to the flow direction of the gas.

In the above-mentioned fan unit accommodating housing, the through hole **220** may further include the first receiving part **224***a* that is engaged with the engaging part **212***a* of the fan cover **212** on an inner peripheral wall, and the first receiving part **224***a* may be formed so as to expand to the outer side with respect to a part of the inner peripheral wall other than the first receiving part **224***a*.

The invention claimed is:

1. A blower for an air-conditioned garment, the blower comprising:

a main body part including:

a fan; and

a motor that drives the fan; and

a rear frame that is engaged with the main body part, the blower being installable on the air-conditioned garment by separable engagement of the main body part and the rear frame, wherein:

the main body part includes:

a power supply unit that supplies power to the motor;

a control unit that controls driving of the motor; and

an operation input unit that inputs a signal to the control unit in accordance with operation of a user;

the power supply unit being formed such that a distance between the power supply unit and a rotation shaft of the fan in a direction orthogonally intersecting the rotation shaft of the fan is longer than an outer diameter of the fan, the power supply unit being adjacent to an outer periphery of the fan at a longitudinal side of the power supply unit, wherein the power supply unit comprises a plurality of power supply units, the power supply units being unevenly distributed on a lower side adjacent the outer periphery of the fan; and

the main body part and the rear frame are formed so as to sandwich the air-conditioned garment between the main body part and the rear frame.

2. The blower for the air-conditioned garment according to claim **1**, wherein:

the rear frame includes a suction port that sucks in gas; and

the suction port has an inner diameter that gradually expands toward a rear side in a flow direction of the gas.

3. The blower for the air-conditioned garment according to claim **1**, wherein the main body part further includes:

a through hole that houses the fan in a rotation shaft direction of the fan; and

a fan cover that detachably occludes the through hole on a front side with respect to the fan in a flow direction of gas.

4. The blower for the air-conditioned garment according to claim **3**, wherein:

the fan cover includes an engaging part that is engaged with an inner peripheral side surface of the through hole; and

a length from the rotation shaft to an inner peripheral wall of the engaging part is longer than the outer diameter of the fan when the fan cover is engaged with the inner peripheral side surface.

5. The blower for the air-conditioned garment according to claim **4**, wherein:

the fan cover further includes an exhaust port formed on the front side in the flow direction of the gas so as to be continuous with the engaging part; and

the exhaust port has an inner periphery that expands to an outer side from the inner peripheral wall of the engaging part.

6. The blower for the air-conditioned garment according to claim **1**, wherein the power supply unit comprises a fixed power supply unit.

7. The blower for the air-conditioned garment according to claim **1**, wherein the power supply unit comprises a removable power supply unit.

8. The blower for the air-conditioned garment according to claim **1**, the plurality of power supply units being formed such that the distance between each of the plurality of power supply units and the rotation shaft of the fan in the direction orthogonally intersecting the rotation shaft of the fan is longer than the outer diameter of the fan, the plurality of power supply units being adjacent to the outer periphery of the fan at the longitudinal side, the plurality of power supply units being unevenly distributed on the lower side adjacent the outer periphery of the fan.

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